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PC WORLD

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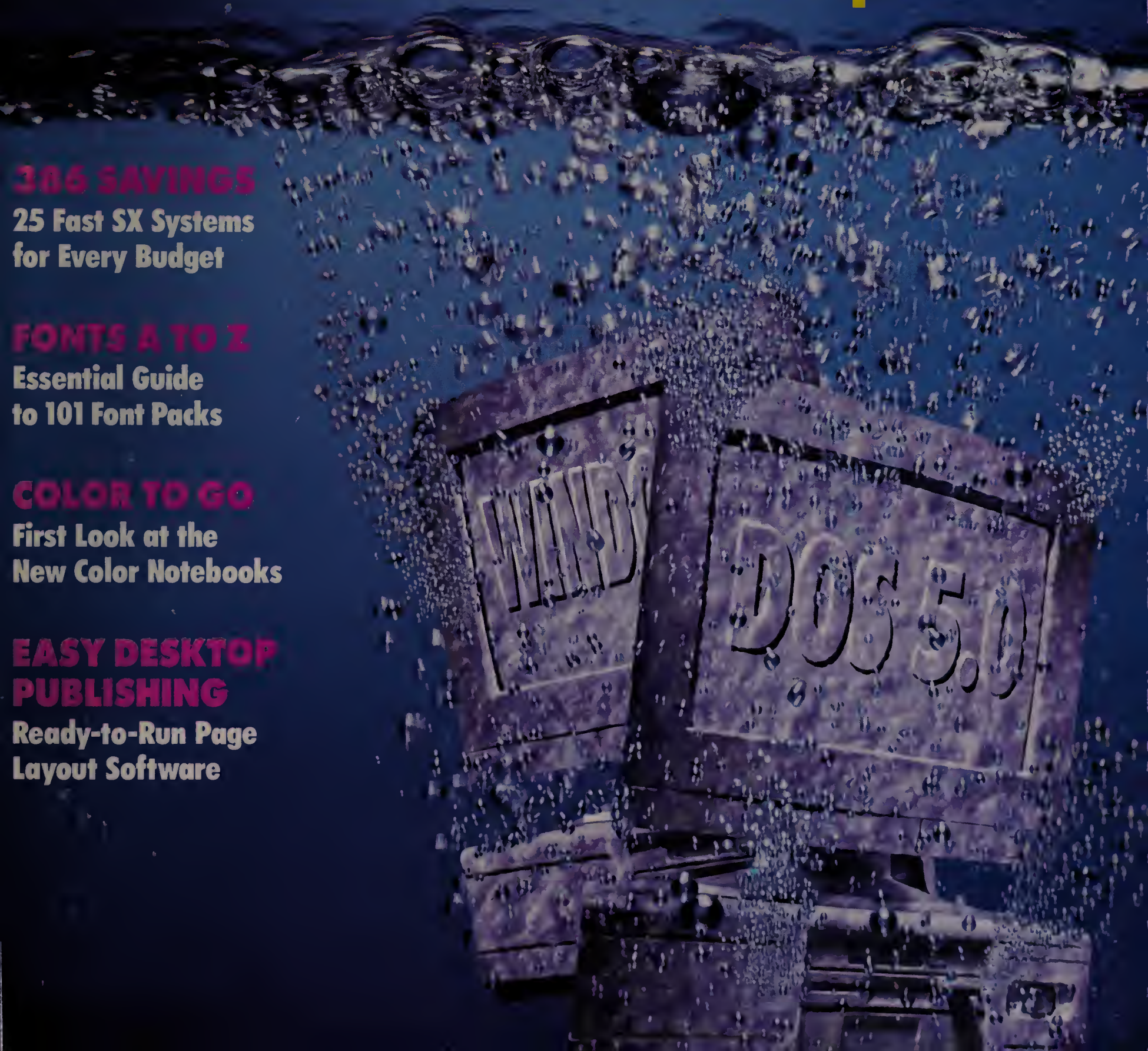

The first word processor that works like second nature.

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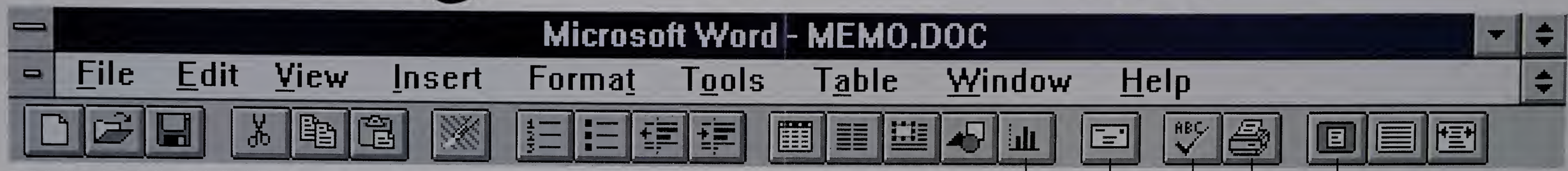
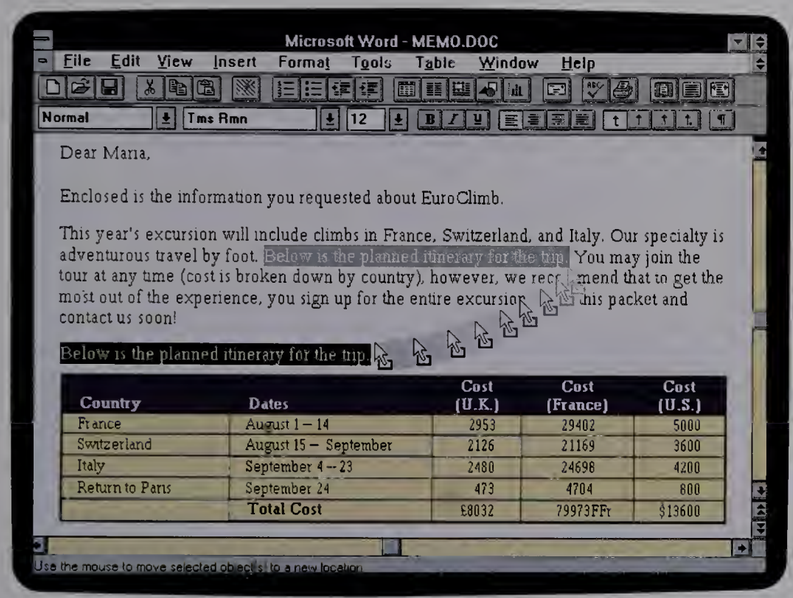
Introducing new Word for Windows 2.0.

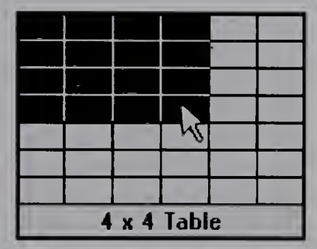


The Toolbar lets you do everyday things with the click of a button.

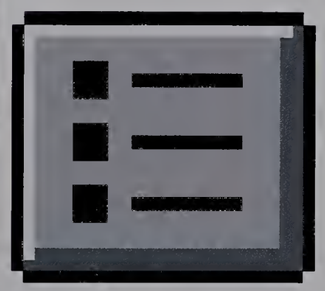
Click here for automatic envelopes. *Click here to print your work.*
Click here to make charts. *Click here to check spelling.* *Click here to zoom in.*



Rearranging a document couldn't be any easier. With new Word 2.0 you can drag and drop text wherever you want.

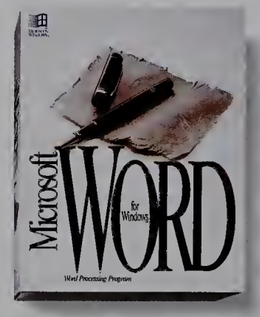


All it takes is one click on the Toolbar and presto, instant tables.



Click this Toolbar button and get instant bullets.

The mouse makes everyday tasks as easy as click, click, click.



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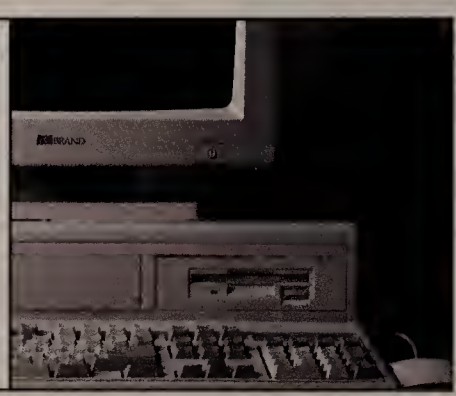

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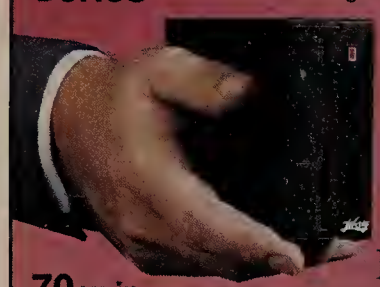

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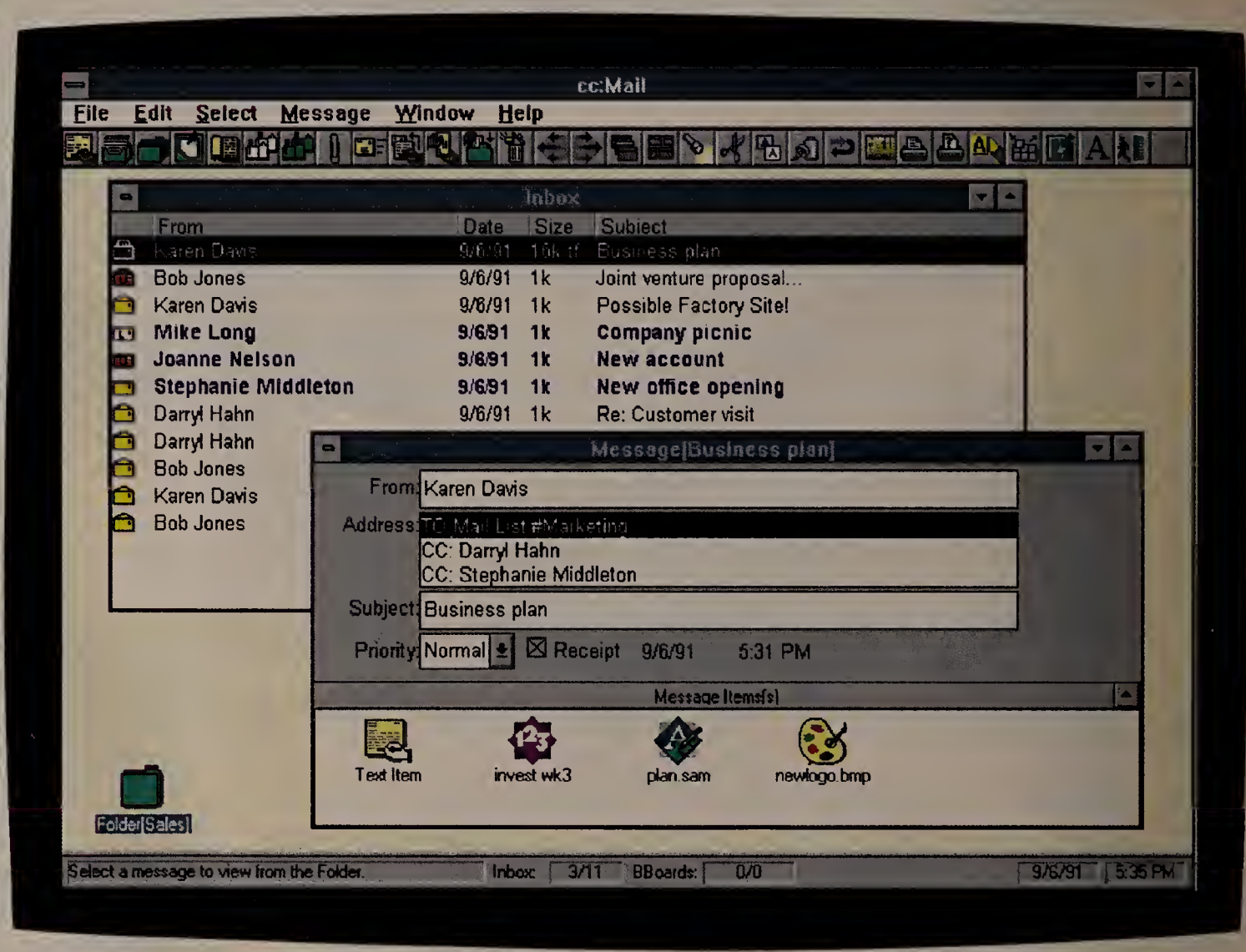

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Circle 10 on reader service card

The tips team: Bronwyn Fryer, Karl Koessel, Susan Lusty, Rex Farrance

ROBERT CARDIN

50 Ways to Save Your Sanity

Maybe you've always wanted to write an AUTOEXEC.BAT file that does handstands, or run your favorite DOS application under *Windows* without fearing for your life. But who's willing to expend the effort to perform such magic, even if the result saves valuable time day after day?

The short answer is, we are. Not only we the editors of *PC World*, but also consultants, authors, tech support people, and readers who have taken the time to solve pressing problems and share the answers with you. The fruits of this labor are our annual gift to the beleaguered user: tips unlimited.

This year our four-person editorial team searched high and low for the 50 best DOS and *Windows* tricks. Bronwyn Fryer, Rex Farrance, Karl Koessel, and Susan Lusty scoured BBS's, called tech support lines, broadcast all-points E-mail bulletins, and did some assiduous hacking of their own to find more efficient ways to make DOS and *Windows* do what you need them to.

There's something here for all types of users. Upset with *Windows'* File Manager? We can help. Wondering why your system software is gumming up performance or maxing out your hard disk? Hey, we've been tweaking this stuff for years. Even users who edit their CONFIG.SYS file almost daily may learn a trick or two.

You'll notice that about a quarter of these tips are specifically for DOS 5.0. This most popular of all DOS upgrades may be vastly easier to learn, but that doesn't mean it's completely intuitive. Our tips team shows you how to get the most from the graphical shell and from such handy utilities as DOSKEY.

This issue's tips aren't just button pushing. The Special Preview Section offers tips of another kind: the pick of hot hardware and software to watch in 1992. We sent our staff on the road to bring you timely information about products bound to affect your purchasing plans in the coming year.

Frankly, we haven't seen such a whirlwind of new products since the PC was introduced. Who could have guessed that early this year we'd see battery-powered 5-pound color notebooks. Or low-end systems that accommodate multiple microprocessors (if you can keep track of which chip is which now that Intel has competition from AMD, IBM, and Chips and Technologies). Pen-based notebooks with applications that recognize your handwriting are arriving in force, while every DOS application and its brother marches toward *Windows*.

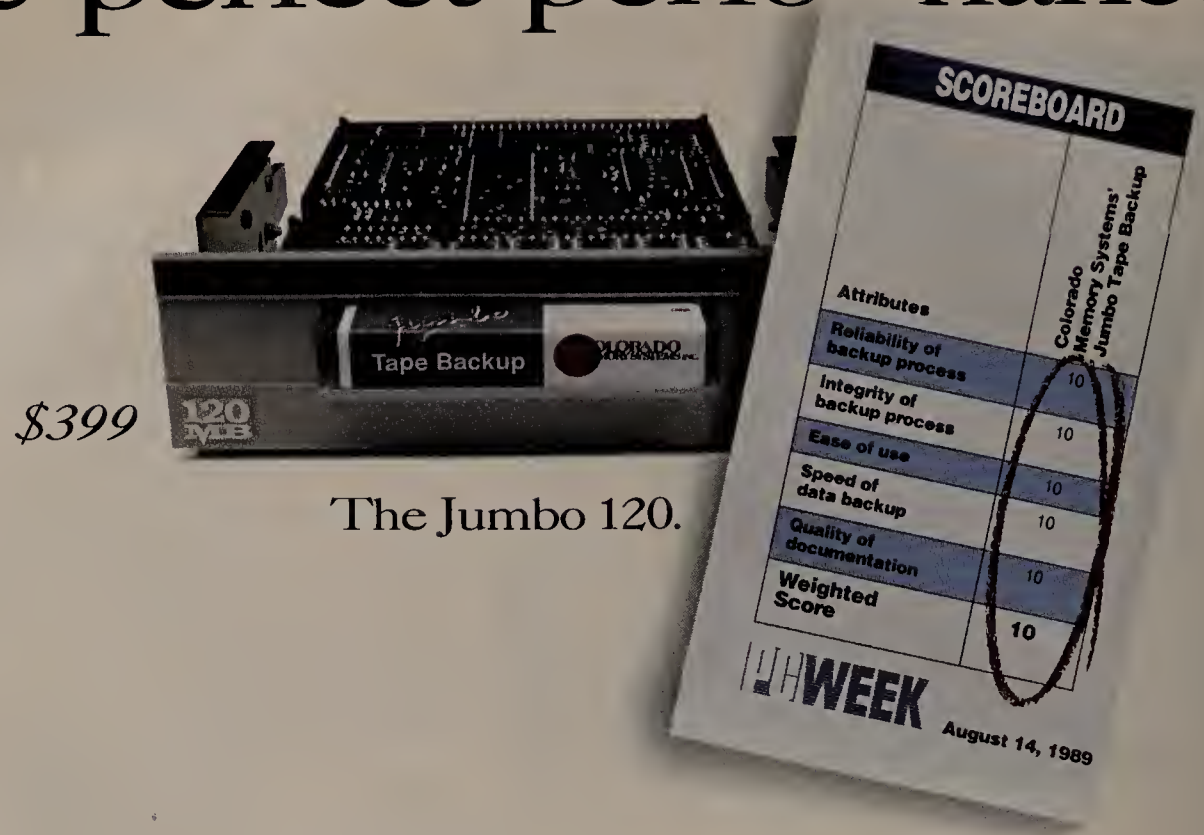
You'll find a taste of this and more in the Special Section. And later this year, you can depend on *PC World* to point out the star products in this Big Bang of new technology.

Last, to demonstrate that we not only give advice, we also take it, this issue features our first 25-system review. Many of you recommended we survey a larger field of products than just the usual suspects, especially because today's small manufacturers seem to be running rings around the likes of Compaq and IBM. In "20-MHz SXs: Clones Turn Up the Heat," you'll find the biggest herd of hardware ever, with the same thorough benchmarks and comparative ratings you've come to expect.

One more tip: It's going to be an exciting year, and you've come to the right place to stay on top of it all—from hot new products to advice that makes your job easier.

Eric Knorr
Editor

The perfect performance.



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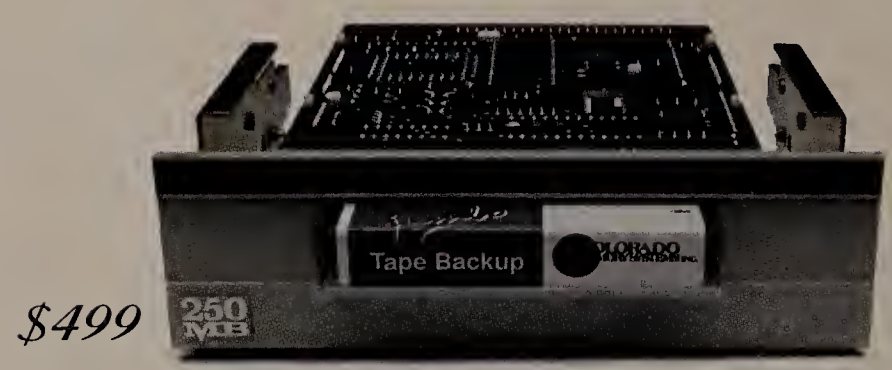
The Jumbo 120.

The encore.



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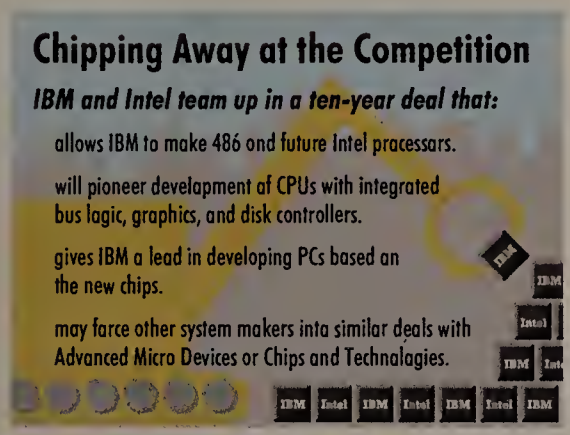
Circle 46 on reader service card

Edited by RUSSELL GLITMAN

Intel, IBM to Create Chips

Integrating Functions on the CPU

Accelerating the race toward powerful and inexpensive new processors, Intel and IBM have agreed to jointly develop chips based on the 486 and future Intel processors. Due out in two years, the chips will integrate the processor with other functions such as a bus adapter or graphics controller, offering users cheaper and more functional PCs.



The IBM-Intel alliance promises to create an array of CPU alternatives with specialized functions.

Under the ten-year agreement, IBM can make as many as half the chips it requires. Intel will supply the remainder and also offer the new chips to other vendors. IBM will get the chips several months before its rivals. Intel will continue to offer other versions of the 486 and 586, adding to the blizzard of processor choices confronting customers.

Integrating more functions into the processor will not only drop costs but improve reliability and speed while reducing size and power requirements. The new Intel/IBM designs will be vastly more powerful, exploiting chips crammed with 4 to 8 million transistors (by comparison, today's 486 has 1.2 million). Instat vice president Dean McCarron suggests that functions may be added in roughly the following order: system logic, serial and parallel ports, a Micro Channel adapter, an XGA adapter, a hard drive controller, and eventually other features.

While other manufacturers could make similar development deals with Intel or other competing CPU suppliers, none can match IBM's impressive combination of experience and deep pockets. In contrast, Compaq has invested in Nexgen, a start-up CPU supplier, but is refocusing on "cutting overhead and using off-the-shelf components," notes International Data Corporation analyst Bruce Stephen.

Under the agreement, IBM can't create its own derivatives of the 486 as it did with the 386.

—Eric Bender

Compaq Cuts Costs, Prices

Moving quickly in November, new Compaq Computer chief executive Eckhard Pfeiffer launched a series of changes in his company's pricing, distribution, and support policies that virtually re-create the company.

The shake-up comes after a series of startling reversals at Compaq. The company reported its first-ever quarterly loss—a stinging $70 million for the quarter ended September 30, 1991. Then, founding CEO Rod Canion was toppled during a marathon board meeting, and 1700 Compaq employees were laid off. Several other senior executives associated with Canion have since departed the company.

Taking a firm grip on the reins, former operations chief Pfeiffer followed through on a vow to reduce manufacturing costs, product cycles, and prices by slashing notebook prices 25 percent. Compaq will still sell powerful computers to the world's largest companies but will also challenge cross-state rival Dell Computer and California's AST Research with a new line of low-cost PCs aimed at home, education, and other markets it has previously shunned.

Smaller firms like AST have logged record profits during recent quarters, in part by introducing new technology at rock-bottom prices. Their success also has come from their ability to find routes to customers besides the specialty retailers, to which Compaq had firmly tied itself. Pfeiffer is opening distribution, and says even mail order is under consideration. Dell and AST have also won customers with direct support—a policy Compaq was forced to emulate last year. Compaq is broadening its support policy to include General Electric Computer Service and TRW Customer Service maintenance.

Compaq is well positioned to be a low-cost, low-price supplier, says Kidder, Peabody analyst Dave Korus.

—Mike Hogan

Promoting Presentation Graphics Market

As the presentation graphics market shifts to *Windows*, vendors are courting users with an attractive but bewildering array of new products and discount promotions.

For instance, Microsoft is offering its $495 *PowerPoint* for $129 to those trading up from DOS competitors. Meanwhile Aldus and Lotus say they will swap their $495 *Persuasion* and *Freelance for Windows* packages for $99 and $150, respectively.

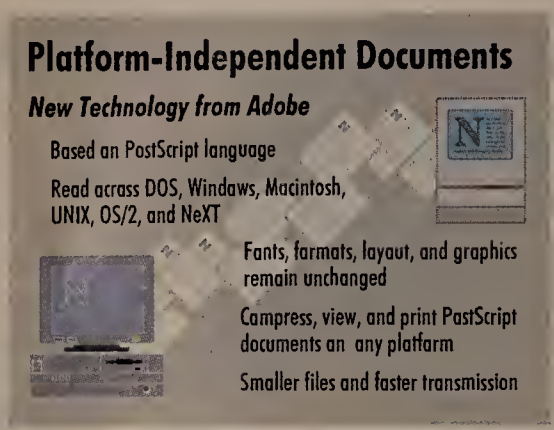
The position of market leader *Harvard Graphics* has been under assault this year as Software Publishing Corporation struggles to bring its own long-awaited *Windows* version to market, says Computer Intelligence analyst Dan Ness. In CI's polls of corporate users, *Harvard Graphics* slipped from its lofty 60 percent unit share a year ago to a still-impressive 48 percent this fall. To stop the slide, the $595 *Harvard Graphics for Windows* will come with a $125 swap promotion but won't reach users until February.

Meanwhile, *PowerPoint* has gained solid ground, jumping from only 5 percent last year to a 28 percent share. One of the first *Windows*-based solutions, *PowerPoint* lacks the functionality of newer programs like Claris Corporation's *Hollywood*, but casual users consider that a plus.

Microsoft reportedly plans a richer version for spring release with features like an outliner. But some *Harvard Graphics* users would rather wait for *HG Windows* than switch. "We need something that we won't have to totally relearn and that can import our existing graphics," explains Peter Forbes Pollack, managing director of New York's Financial Security Assurance. *—Mike Hogan*

Adobe's Master Document

One cherished convention of science fiction is the universal translator: a device that can convert any alien language to the native speaker's format. Now Adobe Systems has a similar plan: software that will let users electronically transmit, view, and print documents created with any application or platform—with all original formatting, fonts, and graphic elements intact.



With Adobe's technology, you can share documents across platforms and retain the format.

Code-named Carousel, the technology is due this year and uses Adobe's PostScript as the common language to move documents across platforms and operating systems. Documents created in DOS, *Windows*, UNIX, or OS/2 or on Macintosh and NeXT platforms are saved as special PostScript files and sent to any other Carousel-equipped machine. There Carousel displays the file—substantially reduced thanks to built-in image compression—with Adobe's Multiple Master fonts substituted for the original typefaces. Multiple Master fonts, which let users alter a typeface's weight, width, size, and style, can simulate any typeface, preserving the overall look and feel of the original document. The PostScript engine also renders any graphical elements that may be included.

Adobe CEO John Warnock likes to talk about the "ASCII jail," where a document gets converted into strings of unformatted ASCII text before it can be viewed in a program or on a platform other than the one where it was created. Carousel could be the "get out of jail free" card, allowing E-mailers to send and receive true-to-life, formatted documents or enabling executives to send presentations to staff and clients.

Carousel could enable publishers to distribute multivolume manuals, directories, or other works digitally, with readers able to view them as they were meant to be seen. It could become known as WYSIWYP—what you see is what you publish. —*Steve Fox*

The Incredible Shrink-Wrapped LAN

Small businesses shopping for a local area network now have a one-stop-shop alternative. Both Northgate Computer Systems and Packard Bell are selling "shrink-wrapped" LANs: ready-to-use networks that come complete with PCs, server, network cabling, and installed software. Packard Bell bundles *Microsoft LAN Manager* with OS/2 and sells its LAN through discount retailers and computer superstores. The company's technicians then install the LAN. Northgate, which bundles Novell NetWare with its LAN, sells it through the mail-order channel and lets the buyer install the equipment. A four-node network can be bought for less than $17,000.

"This is clearly for people who understand what they need and just want a place to get it as quickly and cheaply as they possibly can," says Jamie Lewis, editor in chief of *Clarke Burton Report*, a network industry newsletter.

"I'm highly skeptical," says Roland Cole, president of the Association of Personal Computer User Groups.

Nonetheless, users are happy. Rich Bartone, president of Cruise Collection, a Los Angeles travel agency, purchased his five-node Packard Bell LAN at a Costco discount store after seeing a point-of-purchase display.

Far from impulsive, Bartone, who confesses to having "very little computer background," says he spent a lot of time pricing network hardware and operating systems like Novell NetWare 2.2 and *Lantastic* before opting for Packard Bell.

"Overall, I looked at the full program: hardware and software, installation, and on-site service," says Bartone, adding that he likes the one-stop-shop approach.

Installation went off without a hitch, and after one month, Bartone's network is running smoothly and he's one satisfied customer.

—*Jeff Bertolucci*

Borland Shows Windows Products

Borland Int'l plans to ship *Windows* versions of *Paradox* and *Quattro Pro* in the first quarter of 1992. Both promise innovative user interfaces and transparent access to a wide variety of data.

Built with Borland's object-oriented software technology, both applications let you click with the right-hand mouse button on any object (such as a field or chart) and get a menu or dialog box that shows the actions you can take on that object. "Even if you don't know this product, you can point to anything and click the right mouse button, and it will tell you what you can do," explains Borland chairman Philippe Kahn, who expects use of the right button to become standard in *Windows* and OS/2.

Paradox for Windows also includes a handy icon bar for common commands, a paint-package–like form builder, and an enhanced query screen. The interface and tools are identical to those in the upcoming *dBASE for Windows* except for the programming language.

Moreover, both will exploit a new back-end "object layer engine," which promises to let each Borland package easily tap *Paradox*, *dBASE*, *Quattro*, SQL, and other data.

"The interface in *Paradox* is better than any *xBASE* [dBASE-compatible] product, and with *Windows* it's gotten better still," comments Pat Adams, head of DB Unlimited, a consulting company in Brooklyn. "But the object layer engine is the real killer." If users truly can get the data they need regardless of what package they're in, she says, "that's terrific—that's every MIS manager's dream and every end user's dream."

Quattro Pro for Windows takes a new twist on organizing worksheets in three dimensions: a notebook metaphor. The bottom of the screen displays notebook tabs for each file and smaller tabs for each page in the file. This approach makes it easier to copy, link, and consolidate worksheets. Additionally, Borland has made the package more customizable and extended the already strong suite of presentation skills. —*Eric Bender*

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For the first time in the six-year history of *Computer Shopper* magazine's Best Buy competition, one company swept all of the awards in the desktop PC categories. At COMDEX/Fall '91 in Las Vegas, Gateway 2000 was awarded Best Buy honors for 286, 386SX, 386 and 486 systems.

"What's most meaningful about these awards," said Gateway 2000 President Ted Waitt, "is they are given by the readers of *Computer Shopper*, people who are buying and using PCs in the real world."

Shopper readers voted in record numbers: 15,000 people cast over 100,000 votes for products in 27 hardware and software categories. The vote on desktop PCs was a decisive victory for the Midwestern firm customers call the "cow company."

According to *Computer Shopper*, the Best Buy Awards have come to symbolize the best in service, quality, performance, support and product selection. This combination gives you the best value on the market.

It's really no surprise Gateway 2000 systems were singled out as Best Buys since Gateway sells more computers through the direct channel than any other PC manufacturer. This in itself is testament to the value Gateway 2000 offers. One look and you'll be convinced, too.

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16 MHZ 386SX

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- 1.2MB 5.25" Drive
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- 16-Bit VGA with 512K
- 14" Crystal Scan 1024 Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 1 PS/2 Mouse Port
- 124-Key AnyKey Keyboard
- Microsoft® Mouse
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- MS Windows™ 3.0

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20 MHZ 386SX

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- 4MB RAM
- 1.2MB 5.25" Drive
- 1.44MB 3.5" Drive
- 80MB 17ms IDE Drive with 32K Cache
- 16-Bit VGA with 512K
- 14" Crystal Scan 1024 Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 1 PS/2 Mouse Port
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS DOS 5.0
- MS Windows 3.0

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25 MHZ 386

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- 80MB 17ms IDE Drive with 32K Cache
- 16-Bit VGA with 1MB
- 14" Crystal Scan 1024NI Color VGA Monitor
- 1 Parallel/2 Serial Ports
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS DOS 5.0
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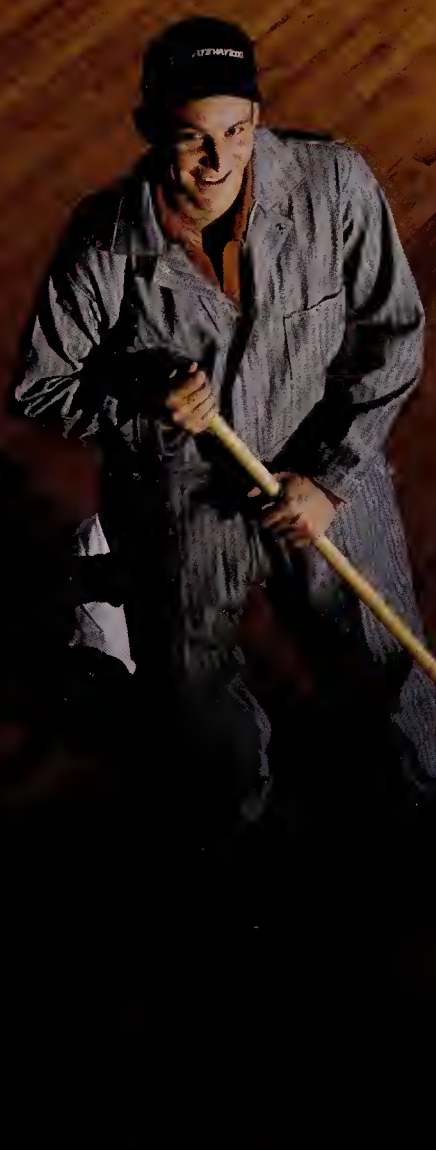

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- 4MB RAM
- 1.2MB 5.25" Drive
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- 16-Bit VGA [illegible]ith [illegible]B
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33 MHZ 486

- Intel 80486 Processor
- 64K Cache RAM
- 8MB RAM
- 1.2MB 5.25" Drive
- 1.44MB 3.5" Drive
- 200MB 15ms IDE Drive with 64K Multi-Segmented Cache
- 16-Bit VGA with 1MB
- 14" Crystal Scan 1024NI Color VGA Monitor
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33 MHZ 486 EISA

- Intel 80486 Processor
- 128K Cache RAM
- 8MB RAM
- 1.2MB 5.25" Drive
- 1.44MB 3.5" Drive
- 340MB 15ms SCSI Drive with 128K Multi-Segmented Cache
- 32-Bit EISA SCSI Controller
- 16-Bit VGA with 1MB
- 14" C[illegible]stal Scan 1024NI Color VGA [illegible]nitor
- 1 Pa[illegible]el/2 [illegible]rial Ports
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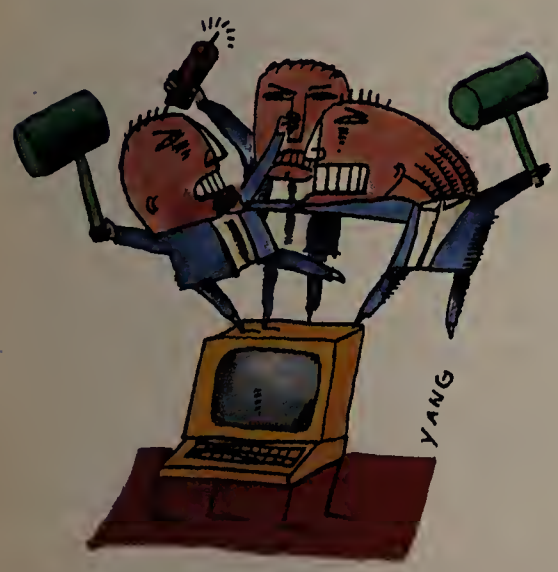
LETTERS

Reactions and responses from the PC World community



JAMES YANG

One Hardware Standard

As a computer consultant, I read with interest your October *Industry Outlook* report on *Windows 3.1.* IBM, Apple, and Microsoft—working together or at each other's throat? It's all a little confusing for workers who want to get their jobs done, not argue the merits of rival platforms. The time has come for one hardware standard in different sizes and speeds. Then developers could unite their efforts to make computers easy to use. But I should be grateful: If developers didn't make their products so hard to understand and use, I'd be out of work.

Scott Gilbert
Santa Barbara, California

Clone-Killing Humor

I would have written sooner about your September cover headline "IBM's Clone Killer," but it took me a while to stop laughing. IBM has adopted its usual ostrichlike posture with these 20-MHz 386SXs. I just bought a loaded 33-MHz 486DX clone with a tape backup and CD ROM drive for less than $6000—one-quarter of what IBM would have charged. IBM started the PC revolution. Why has it abdicated its leadership to the mobs of clone makers?

Walter E. Murdock
Palo Alto, California

A WordPerfect Apology

We apologize for misinformation conveyed in the November preview of *WordPerfect 5.1 for Windows* ["Windows Gives WordPerfect a Shiny New Look"]. At press time, we had expected to ship the product in mid-October and charge $125 for upgrades. We actually shipped in November and fortunately have been able to lower the upgrade fee to $99 for licensed users of *WordPerfect* for DOS. Again, we apologize for any inconvenience this may have caused.

Liz Tanner
WordPerfect
Orem, Utah

Where's Gateway 2000?

I was disappointed that you omitted Gateway 2000's 25-MHz 386 from your October review "25-MHz 386 PCs: Get 'Em While They Last." We have two Gateway PCs at work: Both have operated flawlessly, and the company has provided excellent, responsive service. A current ad shows a 386/25—in the configuration you evaluated—for $1995, with the addition of 1024 by 768 VGA, *Windows,* and a year's free on-site service as a bonus. Taking this value into account, along with the solid response that Gateway 2000 products got in your *World Class Awards* voting and *Rate Your Satisfaction,* how could you leave them out?

Jonathan D. Biviano
Salem, Oregon

We received several letters inquiring about this issue. We did evaluate a Gateway 2000 386/25. But just before press time, Gateway stopped promoting the 386/25 cache model it sent us for review. The company's decision was based on its ability to provide a 33-MHz model at the same price as the 386/25 model we evaluated. Unfortunately, we didn't have time to reorder the noncache model and put it through its paces. —Ed.

Rating on Price

Your October review of 25-MHz 386s leaves me wondering why nobody reviews PCs the way people actually shop for them. Do you really believe that users set out with an undetermined amount of money to purchase the best 25-MHz 386 they can find? The Northgate received a Best Buy largely due to blazing performance, while the FastMicro received only a fair-to-good rating because of poor performance. I don't believe this comparison is fair: Does Northgate have a $1600 to $1700 machine that could outperform the FastData you reviewed?

David Baril
Pawtucket, Rhode Island

Our reviews rate products on overall suitability to their purpose. The Eltech, Everex, and Northgate machines earned their Best Buys with a balance of performance, price, support, design, and expandability. The FastData 386/25 is the least expensive

ANTHONY RUSSO

PC in its class, but overall it didn't rate as highly as the Best Buy machines. As we mentioned, however, bargain hunters may find it irresistible. —Ed.

Traveling Lighter

I read your review "286 Notebooks: Traveling Light" in September, and I'm more convinced than ever that I already have made the right notebook choice with my good old Tandy 200. I take long flights overseas, and battery life is everything to me. I use this text handler for writing memos, and I get 6 to 8 hours of battery life from four alkaline AA cells.

I. Switzer
Palm Springs, California

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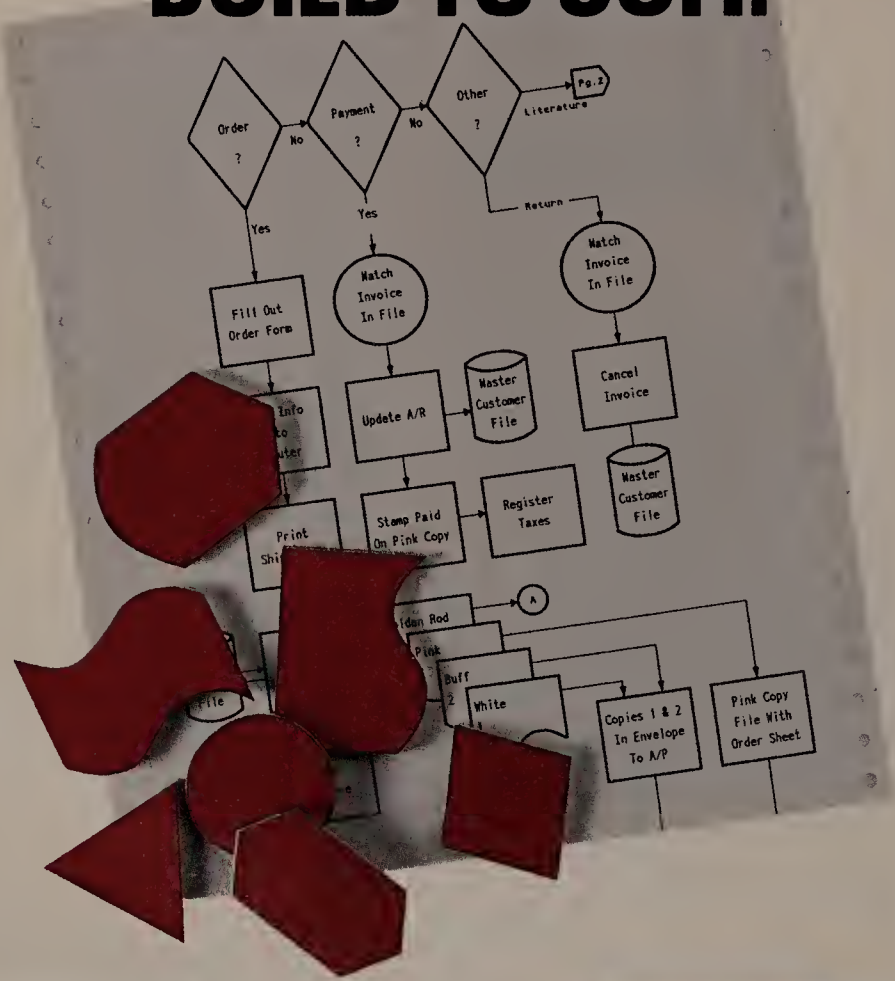

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Circle 233 on reader service card

Big Brother Should Be Watching

I disagree with Keith Nickerson's October *Network Q&A* on diskless workstations. He's right; security *is* the only good reason to use diskless workstations. But he's afraid that the company will seem like "Big Brother" if it implements this measure. Freedom of choice is a right to be cherished at home; it has limited application in the workplace. Companies should set standards and tell workers what applications to use and where to store the company's (not the workers') files. The workplace is not always one big happy family, and as an automation consultant, I've seen companies literally ruined by disgruntled employees. So keeping company data secure is not an option but a necessity.

David Reid
Palatine, Illinois

Better Learning With DOS 5.0

I find it sad that an educator like Stephen I. Klein overlooked the powerful tools of DOS 5.0 and recommended that his college not migrate to it [October *Letters*]. As a student of computer information systems, I see many students

POWER TIP NO. 230

Bold Numbers Form Clearer WordPerfect Outlines

If you use the outline feature in *WordPerfect*, text will wrap around to the left margin regardless of how far an outline element is indented. To make the outline easier to read, put the outline numbers in boldface: Press <F6> before you press <Enter> to go to the next outline number. After the bold number appears, press <F6> to switch back to regular text.

Tom Crone
St. Louis Park, Minnesota

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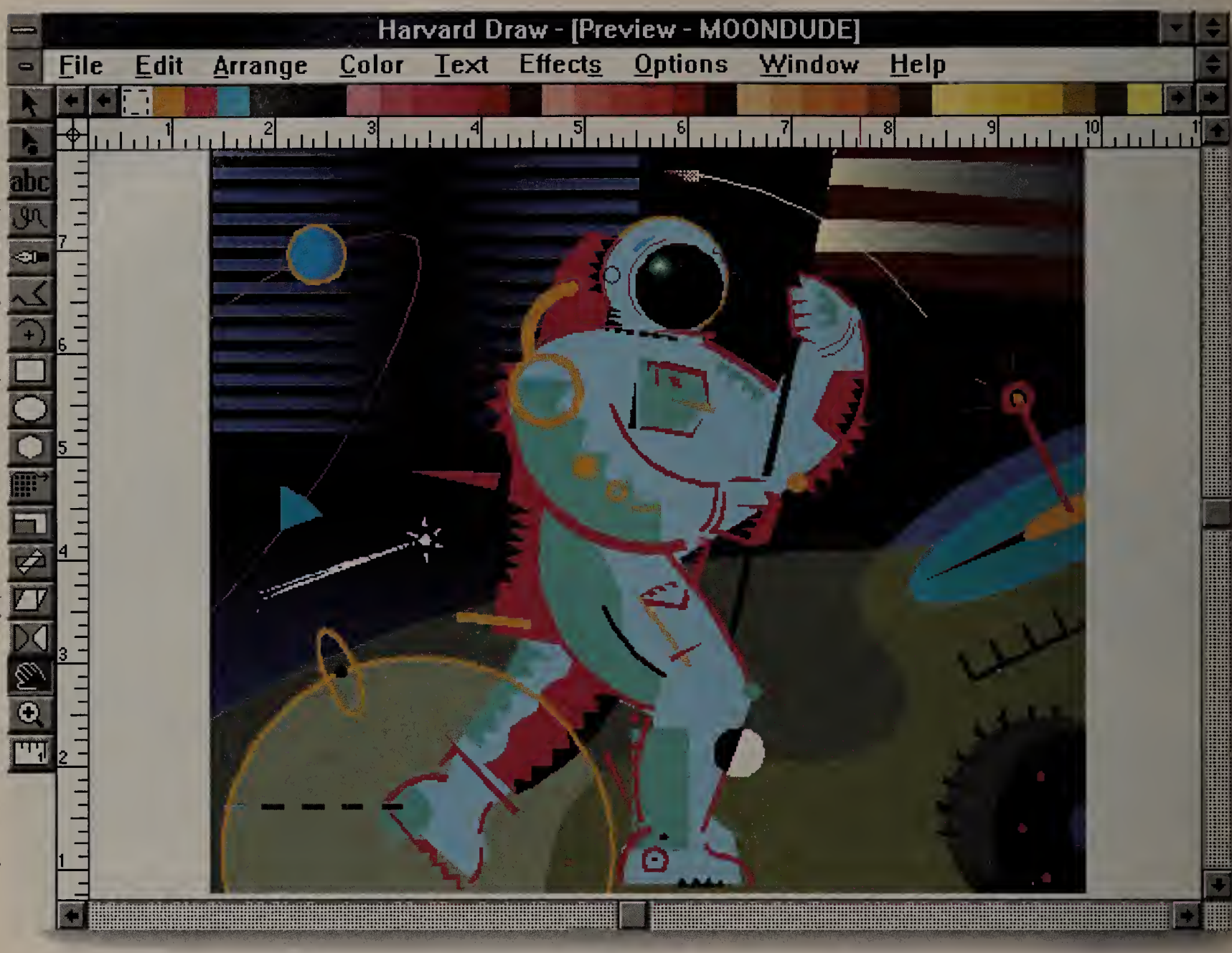

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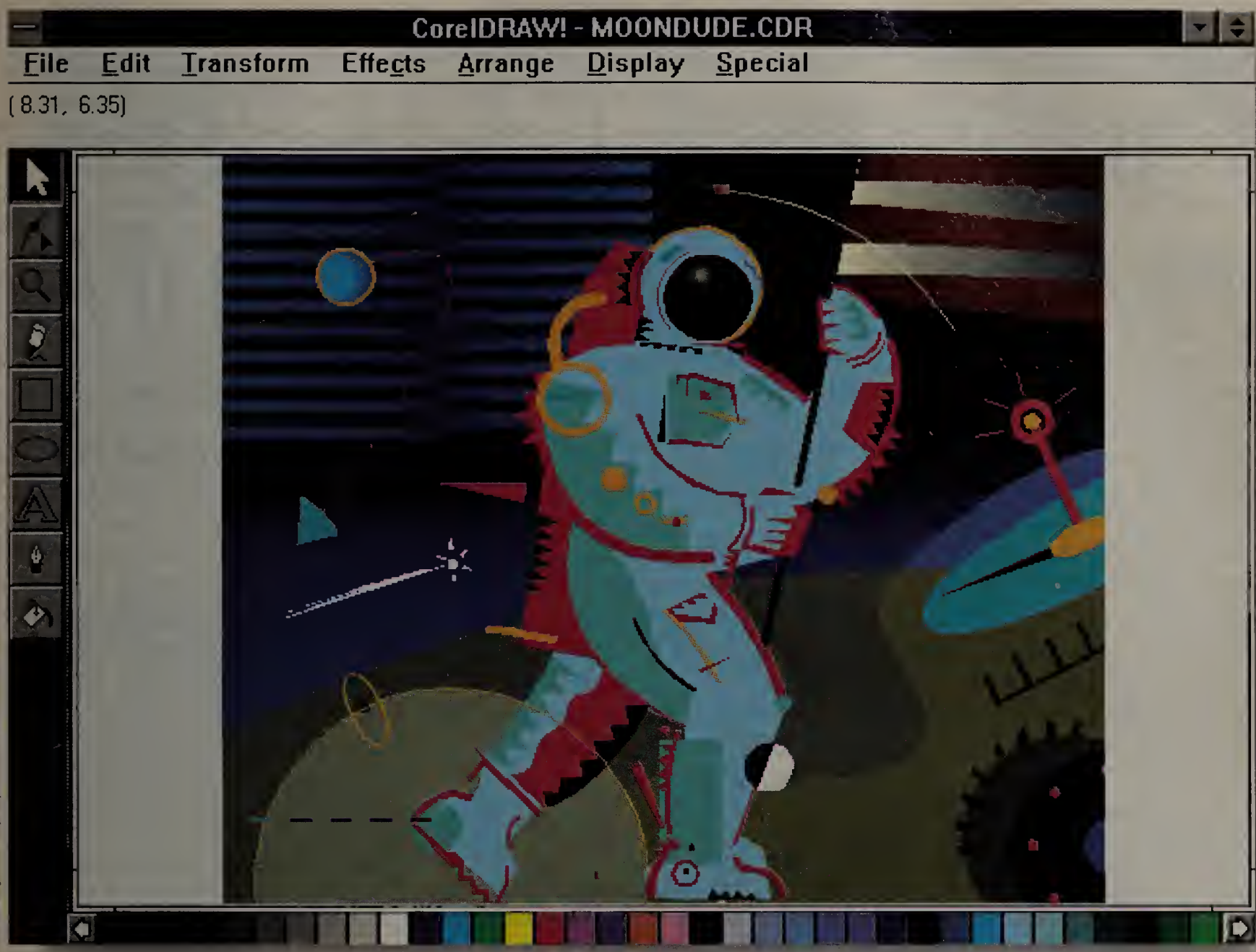

*Timed drawings were created by an experienced CorelDRAW user. For a summary of the test procedure and results write to Harvard Draw Test Results, Software Publishing Corporation, 3165 Kifer Road, Santa Clara, CA 95051

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your own conclusion.

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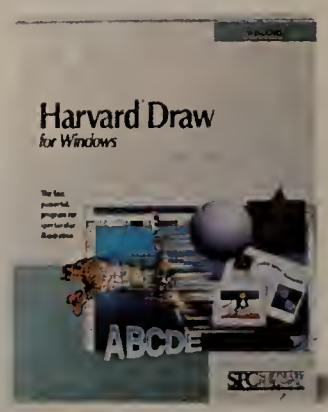

lows demo disk and a NSTL benchmark summary.

SPC SOFTWARE PUBLISHING CORPORATION

struggling with DOS 3.3. DOS 5.0's powerful improvements in function and interface make it the perfect operating system for educational use. It's too bad that decision makers in education bypass this kind of enhancement to DOS.

Dan P. Clark
Orange, California

Windows Accounting Differences

I'm distressed by the treatment of Teleware's *M.Y.O.B. 2.0* in your October *Windows* accounting review ["Windows Balances the Books"]. Teleware addressed the minor interface and documentation concerns before your review appeared. You wasted space on these trivialities while ignoring groundbreaking features. For example, you commented that the sample window shown lacked an OK button for "terminating an action." It doesn't need one! It's not an action window; it's an analysis and reference window. You're missing the mark if you expect sophisticated reporting and graphing modules in *Windows* accounting. Modules symbolize the old straitjacket approach to accounting. If you're analyzing current receivables, you should be able to view the original invoice, jump to the customer's card and check the phone number, and review a list of prior contacts all without having to start a different module. *M.Y.O.B. for Windows* lets you dictate how to do your own accounting by providing a truly interactive program that's useful for an accountant but doesn't leave the neophyte behind.

Christopher P. Lee
Teleware
Rockaway, New Jersey

I received Teleware's update after my review of these packages was completed. I'm glad Teleware has addressed the interface deficiencies I noted, because they detracted from M.Y.O.B.*'s more powerful features and general flexibility. The capabilities Mr. Lee describes are useful, and although they are also found in some other accounting programs,* M.Y.O.B. *does let you easily move between and reference open accounting windows. Whether reporting and graphics are integrated or modular, they should be easy to use, and the interface changes should help* M.Y.O.B., *which has very good graphics features. However, traditional reporting functionality is one area where I feel all the* Windows *products are less robust than their DOS siblings.*

—Richard Morochove

The Changing Price of DesignCAD

Why in the PC world did your October "Buyers' Guide: Low-Cost CAD" list only *DesignCAD 2D* and price it at $349 when an ad from its publisher in the same issue lists *DesignCAD 2D* at $299 and also promotes its latest product, *DesignCAD 3D*, for $399?

Ralph Flye
Gunnison, Colorado

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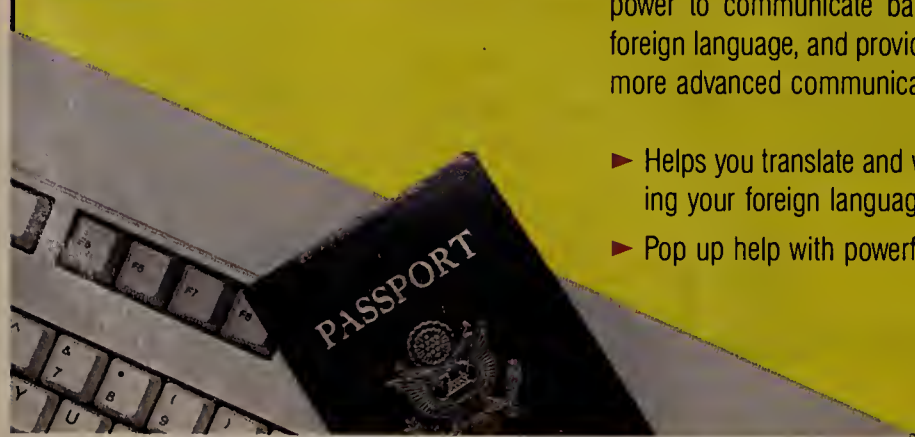

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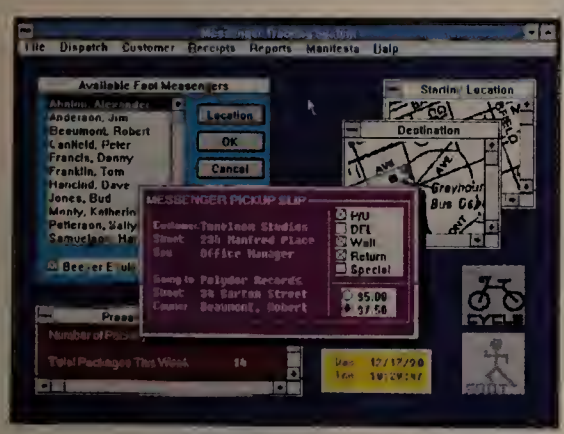

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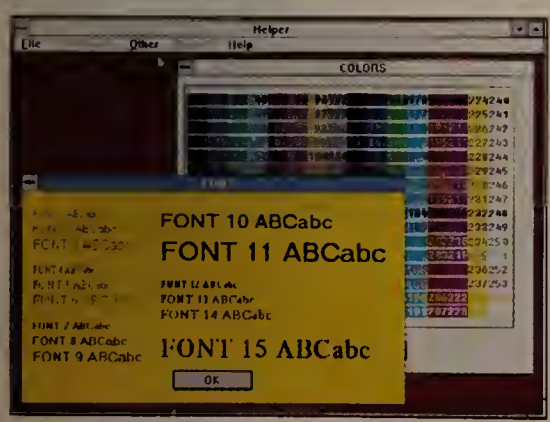

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Corrections and Clarifications

Our November review "20-MHz Notebooks: SX Road Runners" had errors in the Service and Support section of the Features Evaluation. Altima doesn't have weekend support, and Librex does have central phone support.

Send your reactions, responses, and ideas to Letters, PC World, *501 Second St. #600, San Francisco, CA 94107; CompuServe 74055,412; MCI Mail PC World Editorial; or 415/442-1891 (fax). Include your name, city, state, and phone number. We reserve the right to edit letters.*

POWER TIP NO. 231

Quick Rip-Offs With Your Epson Compatible

Many Epson-compatible printers have an auto-advance feature that moves the paper to a tear-off position after a formfeed and a few seconds' pause. On my FX-1050 wide-carriage printer, I discovered that pressing the On Line button twice immediately after a formfeed eliminates the pause and forces the printer to advance the page right away. This saves a lot of thumb twirling when you're in a hurry and need to print several small documents.

Tom Swan
Lititz, Pennsylvania

Presenting
The Next Page
In Printer History.
From The Company
That Printed
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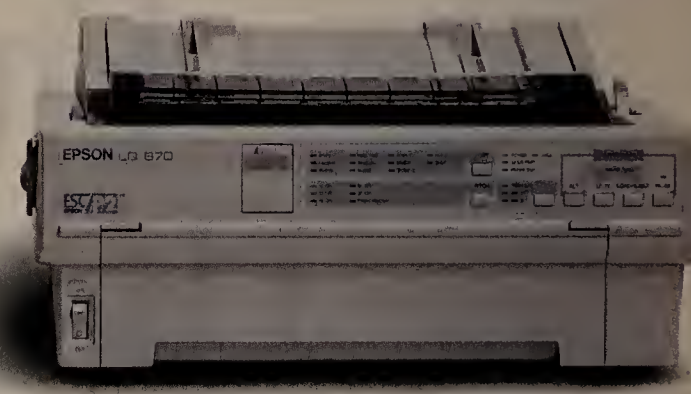

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Then there's Epson SmartPark™ paper handling. At the press of a button and flick of a lever, you can easily switch between two different kinds of paper. In effect, parking one and moving on to another without having to stop to change paper.

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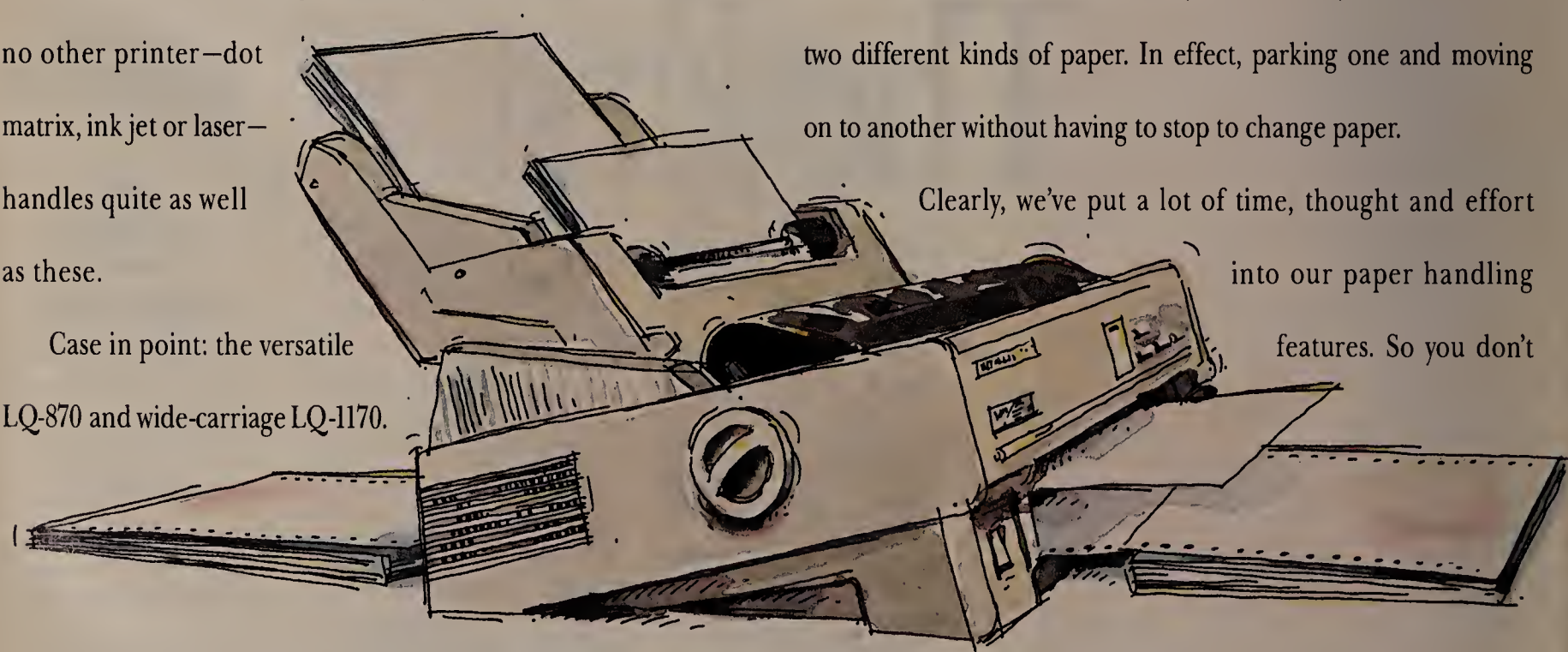

With five different paper paths to draw from at any moment, an Epson LQ printer is as versatile as it is dependable.

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have to put much time, thought or effort into using them.

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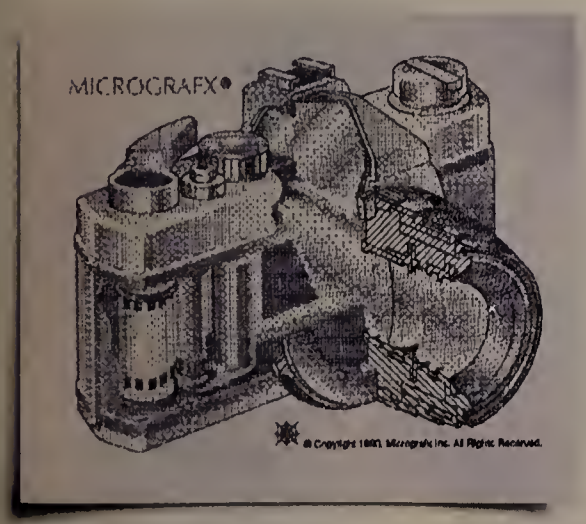

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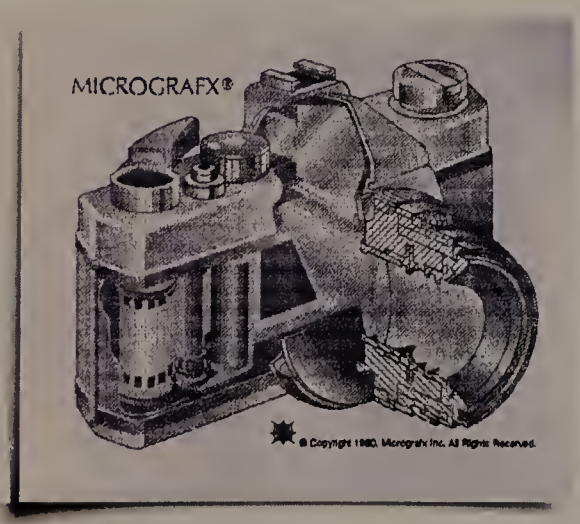

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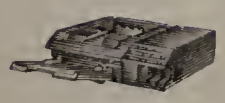

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Karl Koessel and Robert Lauriston

Using 360K Disks in a High-Density Drive

Q. *I bought a used XT clone from a friend, figuring I'd no longer be stuck in the office all weekend when my workload got heavy. My plan hasn't worked, though, because I can't manage to transfer data from the 386 in my office to my XT at home.*

I know the XT can't read the high-density, 1.2MB disks the 386 uses, so I used FORMAT A: /4 on the 386 to format a standard double-density disk to 360K. My XT couldn't read it. Next I formatted a 360K disk on my XT and took it back to the office. My 386 was able to read the disk just fine, so I saved a file to it and took it back home. My XT seemed to read the disk okay (the DIR command worked), but when I tried to retrieve the file, I got error messages.

I've tried half a dozen brands of disks without success. I even bought a disk drive cleaning kit and used it on both drives—still no luck. The crazy thing is, other people in the office with XTs at home don't have this problem. What's going on, and how can I fix it?

J. M. Fortier
Montreal, Quebec, Canada

A. It's not unusual to have this problem with 360K floppy drives, though as you've discovered from your co-workers, it's far from universal.

Your XT's 5¼-inch floppy drive writes 40 tracks on each side of a 360K disk. These tracks produce strong magnetic signals, so your 386 has no trouble reading them. The 5¼-inch drives in 286 (AT) and later systems use a smaller drive head that writes a thinner, magnetically weaker track, so they can fit 80 tracks on each side of a high-density 1.2MB disk. When you format 360K disks in these drives, the tracks are still just as narrow, and your XT's drive isn't sensitive enough to read them.

When you save a file from your 386 to a floppy formatted on your XT, the 386's drive rewrites the disk's File Allocation Table (or FAT, which DOS uses to keep track of where the parts of files are located on the disk), the disk's directory, and the parts of the disk that hold the file you're saving. Your DIR command works (sometimes) because the FAT and the directory occupy outer tracks, which, because they are longer, hold magnetic signals better than inner tracks do. But when your XT's drive tries to read the file data on the inner (now narrow and weak) tracks, you get error messages. Your co-workers don't have that problem with their XTs because some 360K drives are sensitive enough to read the weaker tracks.

One possible solution is to replace your existing drive with a new, more sensitive 360K unit. Another would be to install a high-density drive in your XT along with a special controller board. However, it doesn't make sense to invest that much money in an upgrade. For a couple hundred bucks more, you can pick up a new 286 clone and get a high-density floppy drive with a major speed boost, too.

Back Up Laptop to Desktop's Tape Drive

Q. *I regularly back up my laptop's 30MB hard disk to my desktop's tape drive. I use* LapLink *to copy the laptop's files to a directory on the desktop's 150MB hard drive, back up that directory to tape, then delete the directory. This is tedious and seems like a waste of time—isn't there some way I can back up the laptop's hard drive directly to the desktop's tape?*

Carl E. Lindquist
Bridgewater, New Jersey

A. You want a "zero slot" LAN, like *The $25 Network* or *LANtastic Z*. Both hook two computers together using a null-modem cable (just as *LapLink* does), and each computer's hard disk shows up as an additional logical drive on the other system. For example, if your desktop's hard disk is configured as one big C: drive, the laptop's hard drive would show up as D:. Then you just fire up your tape utility and back up D: straight to tape.

WHERE TO BUY

The $25 Network
Information Modes
P.O. Drawer F
Denton, TX 76202
800/628-7992, 817/387-3339
LIST PRICE: $25
Reader service no. 614

LANtastic Z
Artisoft, Inc.
Artisoft Campus
691 E. River Rd.
Tucson, AZ 85704
602/293-6363, 602/293-8065 (fax)
LIST PRICE: $125
Reader service no. 615

ANTHONY RUSSO

I Can't Hear Myself Think

Q. *I like almost everything about my new 386. It's got plenty of RAM, ample hard disk space, and even a tape drive for easy backups. There's just one problem: The fan is so loud that when I get a long-distance phone call, I sometimes have to transfer it to another phone at a quieter desk. Can I replace the noisy fan with something better?*

Kate Walker
Archer, Florida

A. A California commodities trader encountered the same problem a few years ago. When he couldn't find a quieter fan, he started his own company, PC Power & Cooling, to make noise-busting replacement parts.

The company claims its Silencer power supplies are at least 70 percent quieter than others. (Because the power supply and fan are a single assembly, you need to replace the whole thing.) On top of that, a thermostat embedded in the fan hub measures the exhaust temperature and adjusts the fan speed so it's no faster than necessary. Depending on room temperature and how many boards and drives you have in the box, PC Power says this may result in a 10 to 20 percent additional noise reduction. As a bonus, the Silencers have built-in line conditioning that compensates for spikes up to 6000 volts, brownouts as low as 80 volts, and surges up to 140 volts.

WHERE TO BUY

Silencer 220, Silencer 270
PC Power & Cooling, Inc.
5995 Avenida Encinas
Carlsbad, CA 92008
800/722-6555, 619/931-6988 (fax)
LIST PRICE: 220-watt $139, 270-watt $179
Reader service no. 617

Removing a Spaced-Out File

Q. *I recently installed a program on my hard disk, didn't like it, and decided to remove it. I was able to delete every file but one—VAL ID.LST. The DOS command DEL VAL ID.LST doesn't work. I don't want to use DEL *.* because there are important files in the directory that I don't want to delete. How can I get rid of this file?*

Scott S. Handler
Corpus Christi, Texas

A. You can get rid of that file using DOS's single-character wild card, the question mark. Change to the file's directory and issue the DOS command **DIR VAL?ID.LST** to check the directory for similarly named files you want to keep. Then type **DEL** and press **<F3><Enter>** to delete the file. If you get an 'Access denied' message, use the command **ATTRIB -R VAL?ID.LST** to turn off the read-only flag, then use **DEL VAL?ID.LST** again.

Where Are My Megabytes?

Q. *I've had my 286 for almost five years now. Cleaning out some files, I came across the invoice for the system*

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DOS VERSION

Circle 211 on reader service card

and noticed that it's supposed to have a 40MB hard drive. My DOS shell tells me that my C: drive has only 33 million bytes. The dealer's out of business, so I can't get help from it. Are the remaining 7MB hiding somewhere in my system?

Al Fontes, Jr.
via Internet

A. Your 33,554,432-byte drive C: is actually only 32MB (a megabyte is 1024K, or 1,048,576 bytes). DOS versions before 4.0 (3.31 for Compaq DOS) can't create logical drives larger than 32MB. If your computer dealer did a good job, the "missing" 8MB is on drive D:. If you don't have a D: drive, it's easy to create one using DOS's FDISK utility; if the utility's not on your hard drive, you can find it on your original DOS disks. Don't forget to ensure that drive C: is the "active" drive and, after you exit FDISK, to format the new logical drive.

You should now have two logical drives: a 32MB drive C: and an 8MB drive D:. If you'd prefer to have a 40MB C: drive, consider upgrading to DOS 5.

Make the DOS Prompt Display Your Current Directory

Q. *On most of the computers around my office, you can always see which drive and directory you're in by looking at the DOS prompt. For instance, when you enter CD \LOTUS, the prompt changes to C:\LOTUS>. On my computer, it just stays plain old C>. Occasionally I get so lost I have to press the reset button to get back to familiar territory. How can I make my system work like the others?*

Adrian Brill
Muncie, Indiana

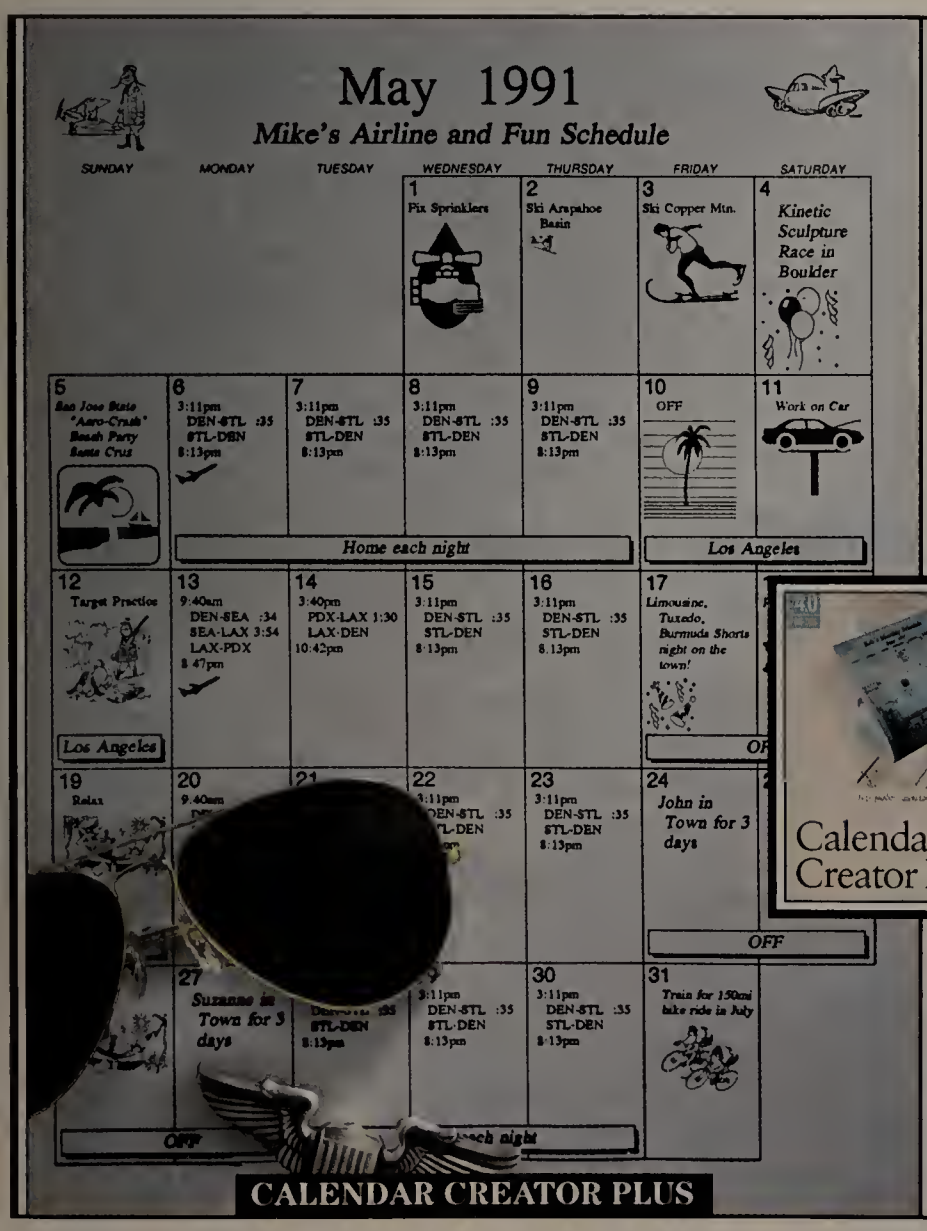
A. You needn't reboot: The DOS command CD (with nothing following it) displays a system's current drive and directory. And to make the DOS prompt display that information, you can issue the command **PROMPT PG**. To add that PROMPT command to your AUTOEXEC.BAT file so you don't have to type it, enter the command **COPY C:\AUTOEXEC.BAT + CON** and press <**Enter**>. The cursor will drop to the next line. Press <**Enter**> again, and type **PROMPT PG**. Hold down <**Ctrl**>, type **Z**, release the <Ctrl> key, and press <**Enter**> a third time.

Mirror Your NetWare Server

Q. *We'd like to provide constant access to our data and applications by setting up a backup server on our NetWare LAN for use when our regular server goes down. What's the best way to "mirror" data to the backup server so that it's as up-to-date as possible when the primary server fails?*

Ernest Bondwell
Utica, New York

A. It would be great to have two servers synchronized through a dedicated high-speed fiber optic connection. You could



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Circle 213 on reader service card

swap hard drives or add boards without having to worry about interrupting other people's work. If the main server went down, the other one would take over immediately and transparently—the users wouldn't even realize that anything had happened. But until it's real for NetWare, you'll have to try one of the following alternatives.

If your network doesn't include *Windows* or Macintosh workstations, check out *No-Stop Network.* It uses a 9K TSR on each DOS workstation. Whenever a user writes to disk (saves a file) on the primary server, the TSR duplicates it on the backup server. If the primary server fails, the TSR redirects all that workstation's reads and writes to the secondary server. Data base transactions are not interrupted—the backup server simply continues the transaction, oblivious to the primary server's crash. *No-Stop* resynchronizes the servers after the primary server is brought back up, but all users have to log off for a few minutes.

If your LAN includes Macs or PCs running *Windows,* check out *ARCserve.* This utility backs up selected directories to the secondary server as often as you choose—say, every 15 minutes. It's not as slick as *No-Stop:* When the primary server fails, users have to log on to the secondary file server manually, restart their applications, and reenter any data that was added after the last *ARCserve* backup. Also, files that are open at the time of the backup will not be copied to the secondary server. You can minimize this problem by using NetWare's Watchdog feature to log out all workstations momentarily at a time of minimal network usage and perform a backup then.

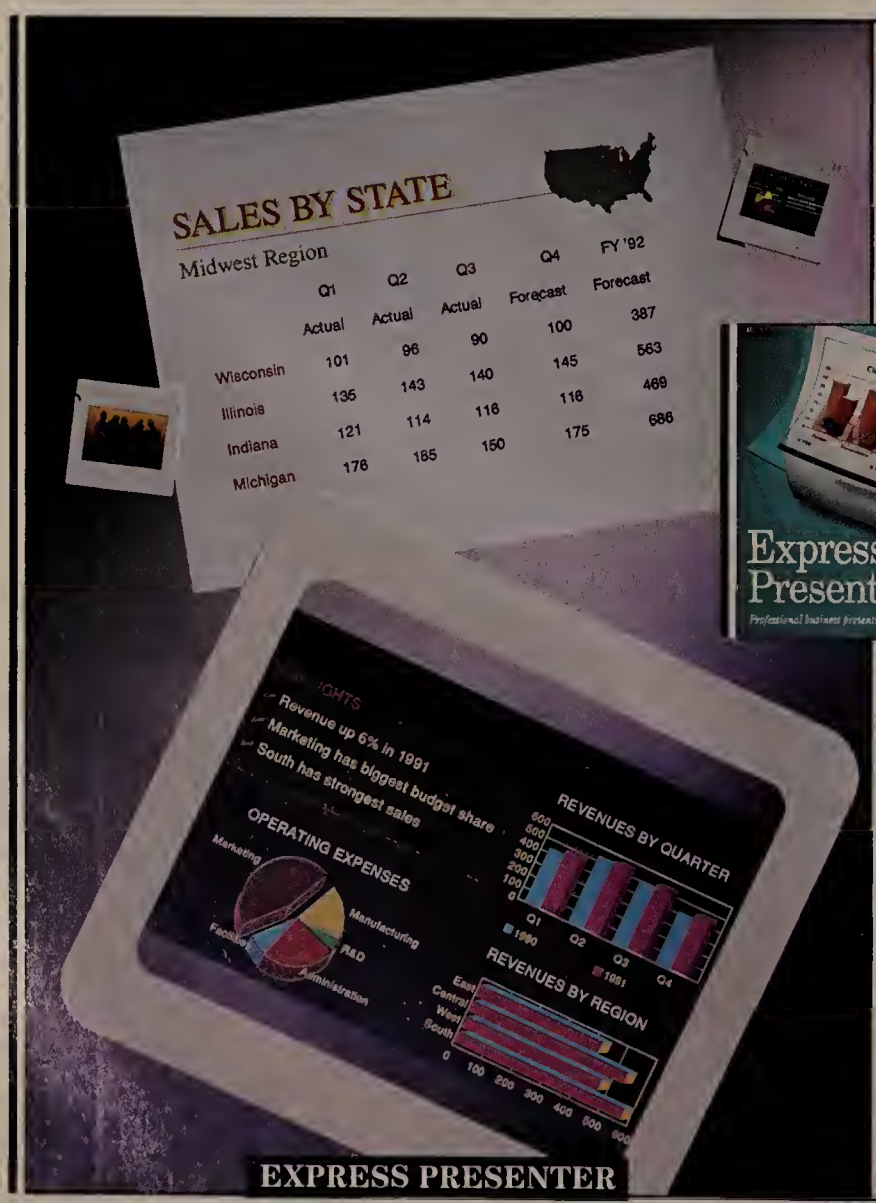
WHERE TO BUY

No-Stop Network
No-Stop Network, Ltd.
20 Waterside
New York, NY 10010
212/481-8488, 212/779-2956 (fax)
LIST PRICE: for 5 workstations $1290, additional stations $25 each
Reader service no. 618

ARCserve
Cheyenne Software, Inc.
55 Bryant Ave.
Roslyn, NY 11576
800/243-9462
LIST PRICE: for NetWare 2.x $1195; for NetWare 3.x $1895
Reader service no. 619

Send your questions to Robert Lauriston, CompuServe 73707,1731; MCI Mail 381-7106; Internet duck@well.sf.ca.us; or 415/442-1891 (fax); or mail them to The Help Screen, PC World, *501 Second St. #600, San Francisco, CA 94107.* PC World *pays $50 for published questions. Sorry, we cannot acknowledge submitted materials.*

Karl Koessel is the technical editor and Robert Lauriston a contributing editor for PC World.



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CONSUMER WATCH

Advice and information for the computer consumer

Christine Whyte

Recycling Toner Cartridges

Environmental alert to laser printer users: The EPA tells us that half of this country's 5500 operating landfills will be full by 1995. Discarded laser printer toner cartridges contribute in no small measure to this crisis. According to market researcher BIS Strategic Decisions in Norwell, Massachusetts, 98 percent of the 15 million cartridges sold in 1991 will eventually end up in landfills.

This is where you come in—by recycling your used toner cartridges and replacing them with remanufactured cartridges, you can reduce the number that are thrown away each year. Since only about 15 percent of cartridges were recycled in 1991, everyone's effort to recycle can make a difference.

You can also save money while helping the environment. Not only can you get cash for your old cartridges, you'll pay less for replacements: The typical street price for a remanufactured cartridge is $40 to $60 compared with $75 to $90 for a new one. Volume prices may be even lower.

What do you do with your used cartridges? Companies that sell remanufactured cartridges pay up to $10 for the Canon SX cartridge used in 70 percent of desktop laser printers, including Hewlett-Packard LaserJets. You can find these companies in the Yellow Pages under *Computer Supplies* or *Copier Supplies* and sometimes in ads in the business section of local newspapers or in computer publications. You can also call Cheryle White, editor of *Recharger* magazine, which maintains a data base of 5000 U.S. cartridge recyclers.

Two of the national companies are Qume and Dataproducts. Qume will send you a carton for your Canon SX cartridge with a prepaid UPS label; all cartridge parts will be recycled, and you'll receive $5. Through its resellers, Dataproducts pays $10 for each Canon SX cartridge, plus the shipping bill if you send 28 or more cartridges at a time. Many smaller companies provide free pickup and delivery and give you credit toward purchase of a new cartridge if you return a cartridge purchased from them.

Canon has a nationwide cartridge recycling program that applies to all Canon copiers, Canon fax equipment, and printers with Canon engines and disposable all-in-one cartridges (those that have a drum, drum developer, and toner in the same casing). Call Canon's toll-free number for instructions and a prepaid UPS shipping label (included with all Canon and Hewlett-Packard cartridges when you buy them). You won't get paid for your cartridge, but Canon donates 50 cents each to the National Wildlife Federation and the Nature Conservancy for every cartridge.

Lexmark International of Lexington, Kentucky, also has a nationwide cartridge recycling program for the six IBM LaserPrinter models in its 4019 and 4029 series. Upon request, Lexmark will send customers a postage-paid container for returning used cartridges. Lexmark gives returned cartridges to a workshop for handicapped adults that makes money by selling the parts to recycling companies.

Under Qume's Q-CARE program, large organizations can designate an employee fund or charity to receive the money from their recycling effort. The Dataproducts Imaging Supplies Division also participates in a fund-raising program; Seattle businesses give their used cartridges to a nonprofit group that feeds the hungry throughout Washington. Dataproducts pays the organization $10 for each cartridge.

For every used cartridge collected from local corporations, Miami's Recycleneur Institute donates $2 to a scholarship fund to help entrepreneurs break into the recycling business. The Recycleneur Institute will mail you a list of cartridge recycling companies in your area.

If you need to replace a used cartridge, find a company that remanufactures cartridges rather than simply recharging, or "drilling and filling" them with toner. The best value is a cartridge that's been dismantled, cleaned, tested, and refilled and had worn parts—particularly the drum—replaced. Before third-party replacement drums for Canon cartridges became available in January 1990, consumers often asked to get their own cartridge back to ensure they weren't getting someone else's older drum. That's no longer an issue. Today's replacement drums can be recycled five to ten times before degrading. Just make sure the remanufacturer guarantees a refund or replacement cartridge if you're unhappy with quality—something any reputable company

ANTHONY RUSSO

will do. Some firms offer customers the option to pay more to be assured of getting an unused drum.

When trying a company for the first time, check out its local business references. Buy one or two cartridges to test quality before committing to a larger purchase. Ask whether a company's remanufactured cartridge meets or exceeds original specifications. And insist on a written guarantee that your printer will be repaired or replaced with the same model if a remanufactured cartridge causes damage. Although experts in the cartridge recycling business say a good remanufactured cartridge entails no more risk than a new cartridge does, the printer warranty may not cover damage from a remanufactured cartridge.

INFORMATION

Canon Clean Earth Campaign
800/962-2708
Dataproducts Imaging Supplies Division
800/423-5095
Lexmark Operation Resource
800/848-9894
Qume Corp.
800/421-4326
Recharger, Cheryle White
714/359-8570
Recycleneur Institute
305/539-0701

SHOP TALK

Mail-Order Nightmares

Editor's note: PC World *received seven complaints about two mail-order firms—Stargate Computer and 1 Stop Micro—reporting money paid for products that were never delivered. (At press time,* PC World *received eight more complaints about 1 Stop Micro.) These cautionary tales serve as reminders to protect yourself when purchasing through mail order: Get recommendations from people you trust; inquire about previous complaints with the local Better Business Bureau, U. S. postal inspector, and attorney general; keep a record of all verbal and written contacts with the company; pay only by credit card, and notify the credit card company immediately if you are charged for an item you haven't received.*

Stargate Computer: Dr. K. Raman of West Hartford, Connecticut, sent Stargate Computer a $4384 check for a 25-MHz 486 computer and accessories advertised in *Computer Monthly.* In repeated calls to Stargate owner Ernest Brauch and other Stargate representatives, Raman was promised his computer would be delivered shortly. Seven months after sending his check to Brauch, Raman received a keyboard and monitor but nothing else.

Steven Reschly of Iowa City, Iowa, sent Stargate a $1000 deposit for a 25-MHz 486 computer advertised in the *Mensa Bulletin.* After several scheduled delivery dates had passed with no sign of the computer, Reschly told Brauch that he wanted to cancel the order and get his deposit back. A year later, Reschly still hadn't recovered his deposit despite numerous phone calls to Brauch.

Brauch told *Consumer Watch* he would ship the rest of Raman's computer as soon as Raman made up his mind about what system he wanted. Raman claims he changed the order only when Brauch told Raman he couldn't match the original configuration and asked Raman to alter it. In early September, Brauch told Raman he would send the system in a week. As of late October, nine months after placing his initial order, Raman still had not received his computer.

In response to *Consumer Watch* inquiries about the Reschly matter, Brauch said the deposit was nonrefundable but would be credited toward the purchase of a new system. According to Burbank, California, postal inspector Gerald Gaines, Brauch is under investigation for numerous complaints about not supplying customers with equipment paid for and for supplying equipment inferior to what was ordered. The postal service's advice to consumers who have had a similar problem with Stargate (or any other company) is to contact their local postal inspector and file a fraud complaint.

1 Stop Micro: Carmen Gibbs of Vicksburg, Mississippi, sent 1 Stop Mi-

BUG WATCH

Up-to-date information about hardware and software bugs

Excel 3.0

Excel 3.0 users may find their spreadsheet characters don't print even though the lines do. You may be able to fix this problem: First go into *Excel's* printer setup dialog box (select *File Printer setup* while any sheet is loaded, highlight the printer's name, and select *Setup OK*) and set the graphics resolution to 75 dots per inch (press **<Alt>-7<Enter><Enter>**). Then double-click the *Windows* Control Panel's Printers icon, make sure the printer's name is highlighted, select *Configure Setup,* and set the graphics resolution to 300 dots per inch (press **<Alt>-3<Enter><Enter><Enter>**). The problem involves differences in the way *Excel* and *Windows* use printer drivers. Microsoft is working on new drivers with several printer manufacturers. When these drivers become available, Microsoft will send them to any registered user who requests them.

Microsoft Corp.
800/426-9400

Correction

In the October 1991 *Bug Watch,* we published an incorrect phone number for ordering Microsoft's fixed version of the MS-DOS 5 Task Swapper executable file. The correct numbers to call at Microsoft follow. Registered MS-DOS 5 Upgrade owners within 90 days of purchase: 206/646-5104. Registered owners after that 90 days (this call costs $2 per minute): 900/896-9000.

Customers who purchased MS-DOS 5 with a new PC from a PC manufacturer should contact the manufacturer for the fixed version.

Have you run into a software bug or hardware incompatibility? Call us at 415/978-3253 with the details. We'll investigate problems and report on those with the broadest interest.

—Susan Lusty

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cro a $1023 cashier's check for a Hewlett-Packard LaserJet IIIP printer. When her printer didn't arrive on the promised delivery date, the company told Gibbs that it had been damaged in shipping and that she would have to wait for a printer on back order. Since the new delivery date was more than a month from the date Gibbs originally placed the order, she cancelled her order, and the company agreed to send her a refund. The check never arrived, and the company has not responded to her four follow-up calls.

When Joseph Ferri of Reading, Pennsylvania, mailed 1 Stop Micro an $865 check for a hard drive, two memory boards, and a mouse, he was told the items were in stock and would be shipped via UPS. When several weeks passed and the products did not arrive, Ferri called the company, was told the ordered items were out of stock, and asked for a refund. He was passed around to several people before reaching Martin Martinez, the company's owner, who promised to return the money. Seven weeks after he placed his order, Ferri had received neither products nor refund. Martinez has not returned Ferri's subsequent calls.

Eugenia Simpson and Thomas Simpson, Jr., of Omaha, Nebraska, placed two orders with 1 Stop Micro. The first order included memory chips, a hard drive, and a floppy drive. About three weeks after placing the order, the Simpsons called the company and were told the items had been shipped two days earlier via UPS ground service. Ten days later the products still had not arrived. When the Simpsons placed a second order for a hard drive a week after placing their first order, 1 Stop Micro said the item was out of stock. Two weeks later the company called to say the drive was in. The Simpsons requested UPS second-day delivery, but that drive never arrived either. 1 Stop Micro charged the Simpsons' credit card $1569 for the first order. The Simpsons then cancelled both orders. 1 Stop Micro hasn't responded to the Simpsons' inquiries.

Bob Shetti of Stafford, Texas, used his Visa card to charge a $1217 HP Laserjet IIIP ordered from 1 Stop Micro. Four days after ordering, Shetti was told his printer was on the way. Six days later a company representative said the printer had been mistakenly shipped by UPS ground service but would arrive shortly. Nine days later the company told Shetti the printer was found damaged in Colorado, and because the printers were now on back order, his Visa account would be credited for the full purchase amount. At press time, after a two-month delay, Shetti received the credit.

Frank Jobin of Downingtown, Pennsylvania, was told by 1 Stop Micro that the HP LaserJet III he ordered was in stock and would be delivered within ten days. When the printer didn't arrive as expected, Jobin was told there would be a week's delay before UPS could begin a trace on the printer; meanwhile 1 Stop charged Jobin's credit card account $1525. A week later, Jobin cancelled the order. Forty-five days later, 1 Stop Micro

POWER TIP NO. 232

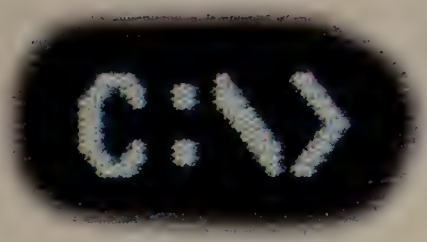
Time and Date Stamping WordStar Files

To place a time and date stamp on your *WordStar* files, use a Shorthand macro. Press **<Esc>?** and then a Shorthand character, say, **T**. Type **<Ctrl>-P<Ctrl>-QS<Ctrl>-P<Ctrl>-QY<Ctrl>-P<Ctrl>-[@ <Ctrl>-P<Ctrl>-[!<Ctrl>-P<Ctrl>-X**. The line will look like this—^Qs^Qy^[@ ^[!^X—in the Definition box. When you want to insert a time and date stamp in a file, just press **<Esc>T**.

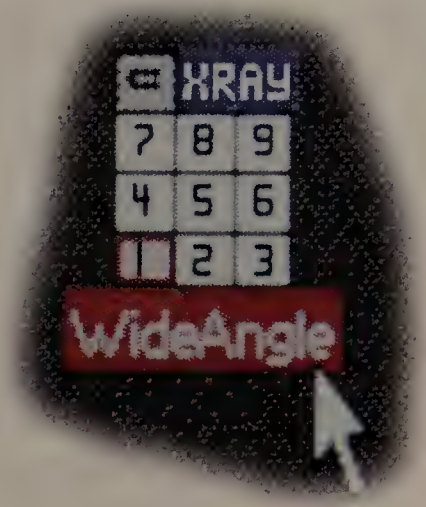
Mike Hogan
Senior Editor

IF YOU WANT TO WORK IN WINDOWS

BUT YOU NEED TO WORK IN DOS



CLICK HERE:



If you love Windows, but you depend on DOS, you need WideAngle 2.0™. It makes Windows and DOS work together your way - without cumbersome application switching, window shuffling or desktop clutter. WideAngle 2.0 expands your windowing desktop to nine screen-sized workspaces, each of which holds multiple Windows applications or a DOS program. To go from one workspace to another, simply click on the interactive Power Ike™ icon, or use WideAngle's equally powerful hot keys. Click on XRAY View™ and 'see through' a screenful of windows to instantly find, activate, tile or close any application. You can customize WideAngle to the way you work. Distribute applications in workspaces according to your own workflow. Create groups of programs to automatically launch. Select applications, like E-mail or utilities, you want to appear in every active workspace. The choices are yours. If you depend on DOS, WideAngle 2.0 makes moving to Windows easy. For more information, call **1-800-736-4198**.

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Circle 73 on reader service card

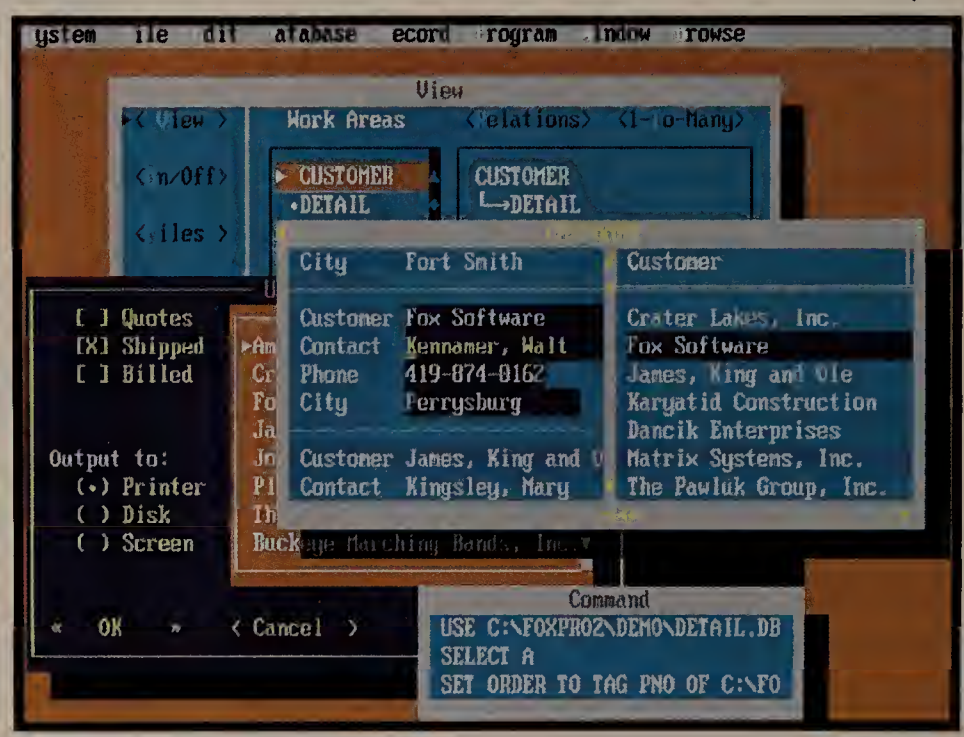
We never dreamed
for creating the best PC

Object-oriented, event-driven operation means that you get the benefits of a Graphic User Interface (GUI) on your DOS PCs, and code that's reusable from application to application.

FoxPro 2.0 is the state-of-the-database-art, an object-oriented, event-driven DBMS that runs in DOS to protect your information systems investments.

Rushmore query optimization is unique to FoxPro and gets your answers as much as hundreds of times faster than competitive products.

4GL Tools (Fourth Generation Language) simplify the creation of Mac-like applications on your DOS PCs, using keyboard shortcuts or a mouse.



For users, the View window makes it easy to work with multiple tables of data, RQBE (Relational Query By Example) simplifies the creation of business queries.

Event-driven operation allows you to work with any number of resizable, scrollable windows, get to all of your data all of the time.

FoxPro 2.0 runs your industry-standard dBASE programs today, lets you build on your current systems for your needs tomorrow.

Optional Distribution Kit creates stand-alone .EXE files for distributing your applications.

Application Program Interface (API) links to external libraries written in C or assembler. Third-parties are currently developing communications, client/server access and other packages. (Optional Library Construction Kit available.)

Applications you write in FoxPro 2.0 can exchange data with our FoxBASE+/Mac on a LAN today, will run virtually unchanged under our Windows, Mac and UNIX versions currently in development (no release date yet).

Response to FoxPro 2.0 has been overwhelmingly favorable.

And that's the problem: the response has been overwhelming.

We're hearing of callers being on hold for 20 minutes or longer!

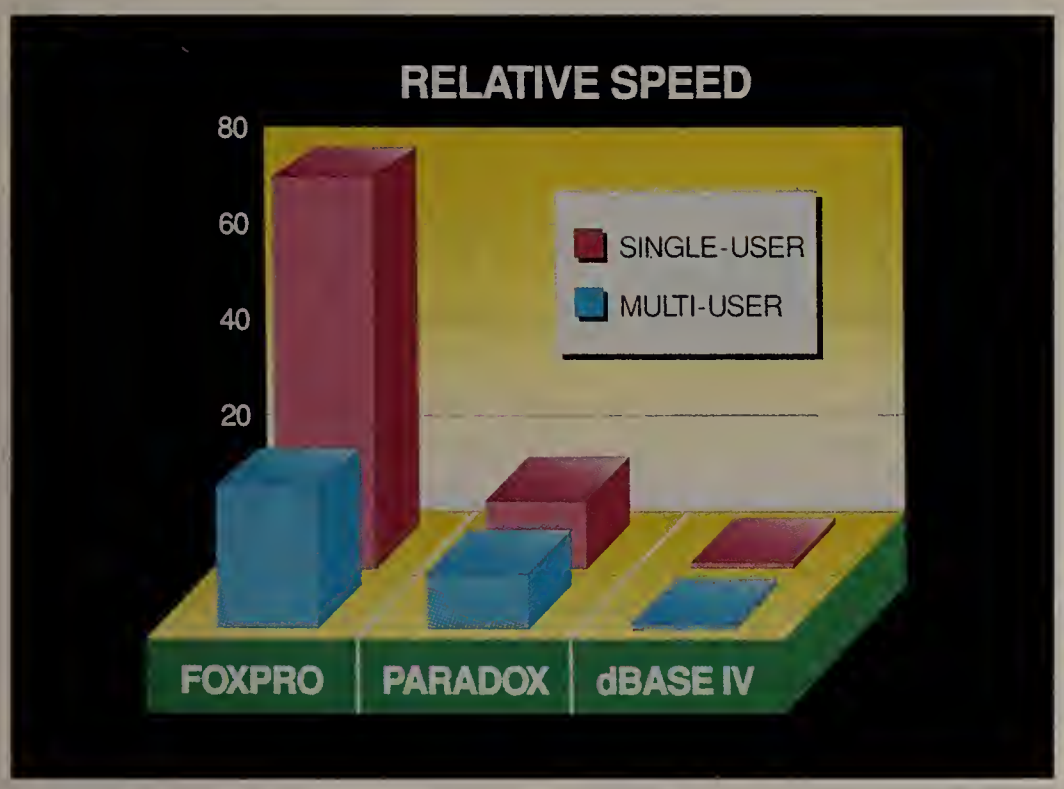
And this in spite of ramping up our support months in advance of the release.

Well, we're adding another 40 phone lines and hiring more people. And if that's not enough, we'll add even more.

In the meantime, we'd like to say

we'd be apologizing database in the world.

Results from an extensive suite of query tests independently performed by Micro Endeavors, Inc. and published in the 8/91 issue of Data Based Advisor.



FoxPro 2.0 is far faster than the other PC database management systems and raw compilers like Clipper, both single-user and on a LAN.

"Thanks" to the tens of thousands of you who put up with the wait, and "Sorry" to those who didn't.

But please try again. We think we've got things under control now.

And FoxPro 2.0 really is worth the wait.

Call 1-800-837-FOX2 or 419-874-0162 again.
(We believe we've fixed it.)

FOX SOFTWARE

Query benchmark tests performed by Micro Endeavors, Inc. (215) 449-4680. FoxPro and FoxBASE+/Mac are trademarks of Fox Holdings Inc.; other products and services are not. © Fox Holdings Inc. 1991.

Circle 76 on reader service card

had failed to credit Jobin's account.

After 1 Stop Micro's Martinez failed to respond to *Consumer Watch*'s repeated inquiries, we talked to Jack Kincaid, the company's operations manager. Kincaid said that the company was having financial difficulties and he didn't know when the letter writers would receive their refunds.

Think you've gotten a raw deal—or a great one? Send the details to Consumer Watch, PC World, *501 Second St. #600, San Francisco, CA 94107; MCI Mail PC World Editorial; CompuServe 74055,412; or 415/442-1891 (fax). We'll investigate complaints and publish letters with the broadest interest.*

Christine Whyte is a freelance editor in San Francisco.

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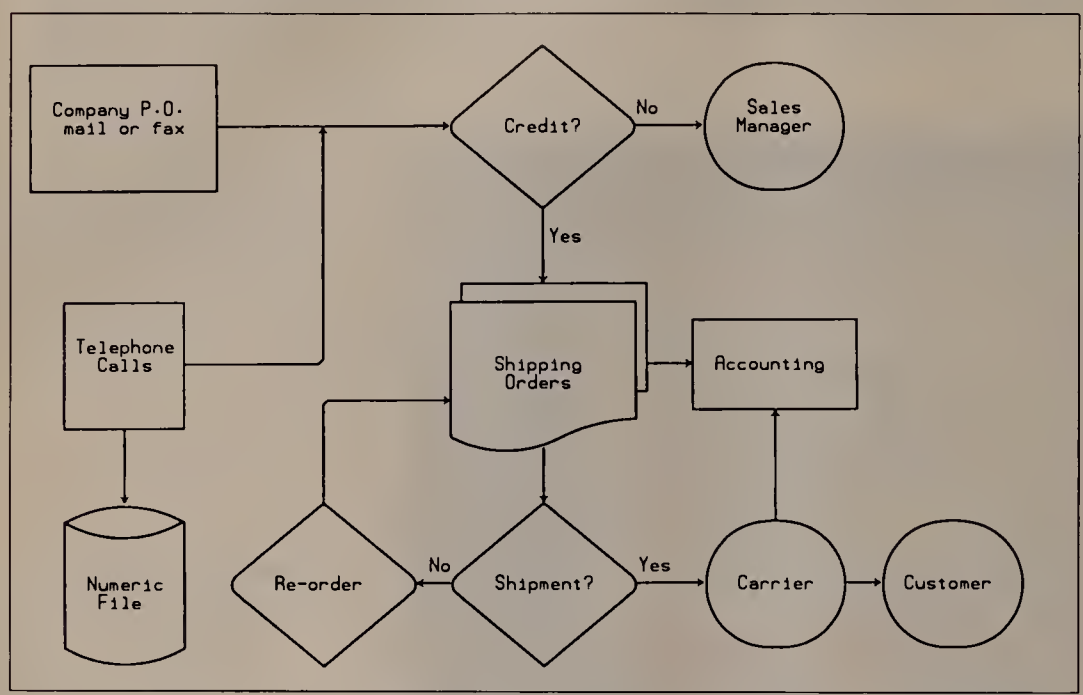

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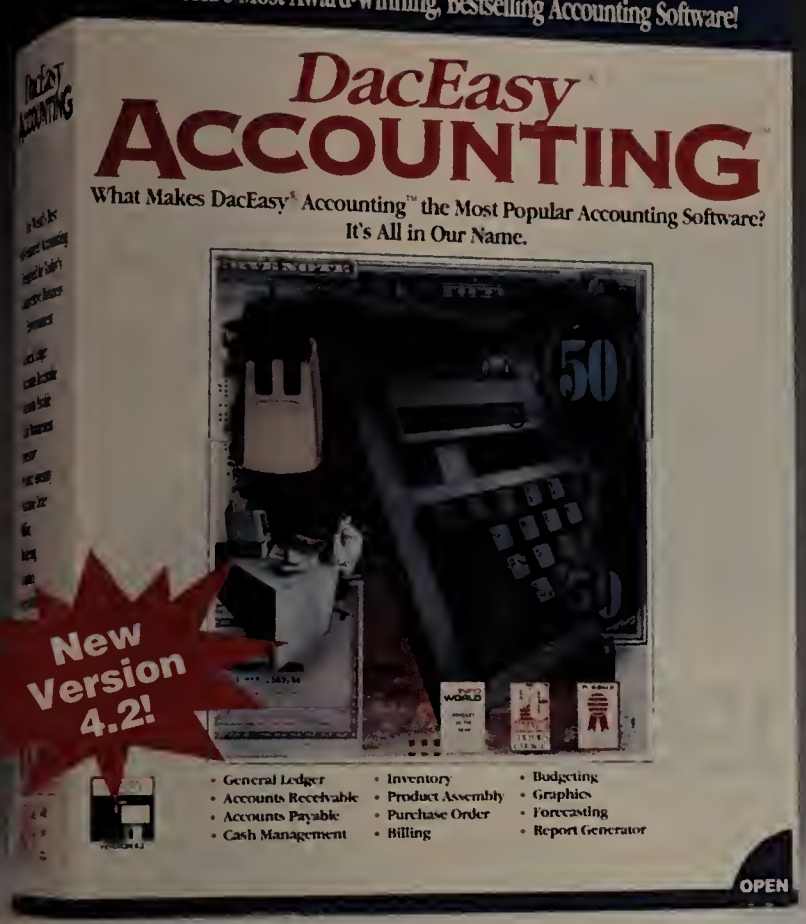
POWER TIP NO. 233

Easy Cleanup for WordStar File Directories

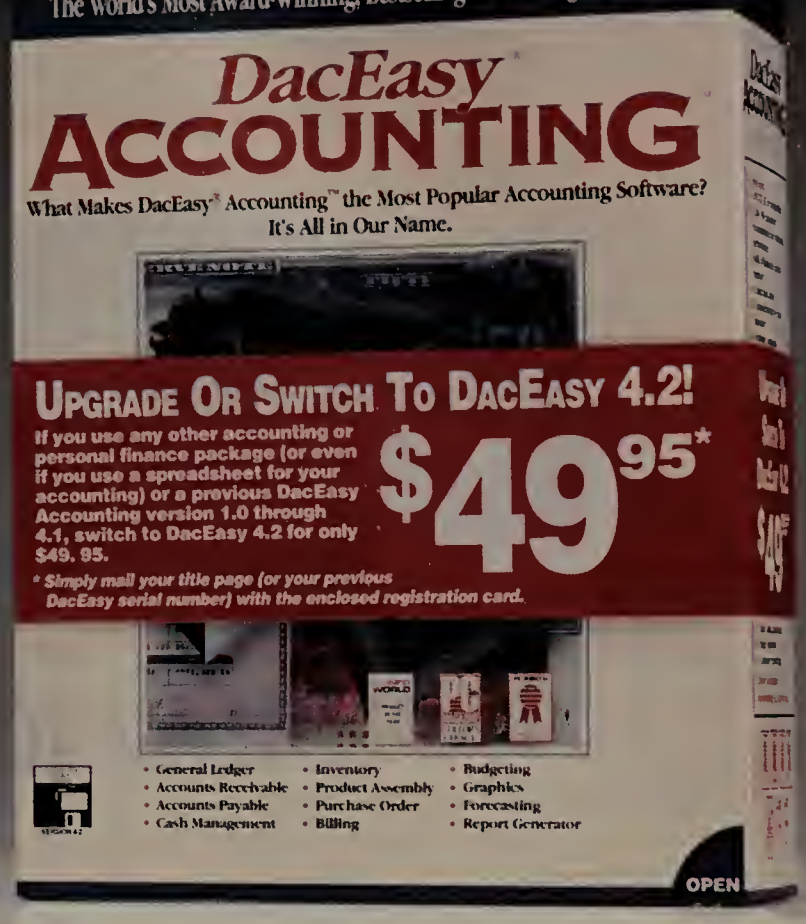
If you want to erase all but a few files in your *WordStar* work directory, you can protect the ones you want to keep by using the C protect/unprotect a file selection on the Opening menu and then deleting the unwanted files in a single pass. First make sure you don't have any program or other files that don't show on your *WordStar* directory. Protect the files you want to keep, then press Y*.*<Enter>. *WordStar* will begin deleting files, prompting you when it encounters one that's protected. Press S to skip each protected file. When finished, unprotect any files you want to be able to change.

Rex Farrance
Assistant Editor

A Deal.



A Steal.



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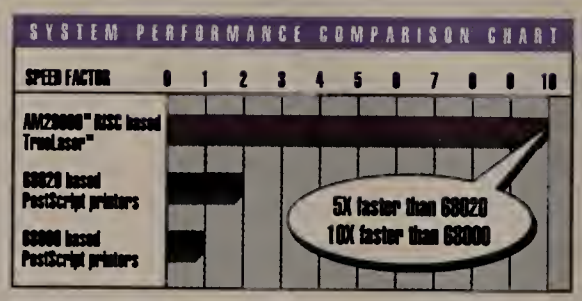

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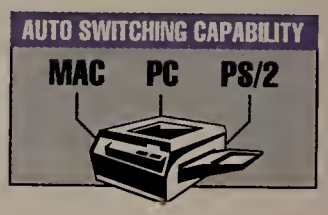
TrueLaser works in just about any computing environment–Macintosh, IBM PC, or PS/2. It comes standard with the three most popular interfaces: AppleTalk, Centronics, and RS-232C. And because TrueLaser includes built-in automatic interface switching, sharing the TrueLaser is a snap.



For added versatility, TrueLaser also provides HP PCL compatibility. Call 1-800-654-4160 or 213-321-2121 for the name of the Microtek dealer nearest you.

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MANAGER'S FILE #9

Choosing an Outside Training Firm

Alice LaPlante

When you shop for a PC training consultant, you may be overwhelmed by the range of choices. Virtually anyone with the remotest experience in the field may advertise "expertise" as a trainer. Although excellent training organizations exist, there are also any number of shoddy operations that will be happy to take your money without providing any measurable benefit. But if you're aware of the various training options and understand when it makes sense to hire a trainer, you can obtain valuable, cost-effective training for your employees.

If you don't have an in-house training staff, your first consideration is whether to hire an outside training firm. For most PC training needs, this isn't necessary. The PC managers we talked to said that 90 percent of their employees' training requirements could be satisfied with off-the-shelf software or video courses, many of which sell for under $100 and can be used repeatedly by an unlimited number of people (see *Manager's File #6*, October 1991).

For employees who learn best from a human instructor, excellent classroom training is scheduled regularly at local training centers and community colleges. If your employees need to learn the basics of *1-2-3* or *WordPerfect*, it doesn't make sense to hire a consultant to build a new curriculum for that purpose when effective options are readily available at a fraction of the cost.

There are times when hiring a training firm makes economic sense, however. If a substantial number of employees need training, hiring an instructor to teach at your work site may cost less than sending those employees to outside classes. The educational content is equivalent, and you'll gain convenience as well. You can also ask the instructor to focus on lessons that are relevant to the way your employees use their PCs.

Hiring a training firm is also practical if your employees are advanced users of complex technology—such as some desktop publishing or data base applications. Generic training packages and classes won't suffice in this situation.

In addition, more and more businesses are writing their own applications specific to their line of work, for which no off-the-shelf training exists. For example, a commercial airline might write an application for the purpose of auditing fares to make sure travel agents are getting the appropriate commissions, or a brokerage house might write their own stock quoting program. In such cases it is a virtual necessity to hire a professional consultant to design and implement proper training on the new software. Otherwise, employee productivity could suffer dramatically.

New multimedia applications and sophisticated authoring tools for creating customized training applications are becoming affordable and easier to use. (See "Build Your Own Multimedia Presentation," November 1991.) These tools range from $300 to $400 prototyping tools that capture screens and add text, to more complex interactive authoring toolkits that cost several thousand dollars. Hiring an outside firm to design a computer-based training program can be cost-effective if such materials will be used repeatedly.

Finally, thanks to the abundance of books, videos, software, and classes, a good consultant may be able to provide just the right mix of training. This approach is substantially cheaper than designing an entire curriculum from scratch, yet incorporates the optimal learning methods for your employees.

Alice LaPlante is a freelance writer in Palo Alto, California.

How to Shop for a Training Consultant

You can't always judge a training firm's quality by its paper credentials. These steps will help you choose wisely.

- ✓ Check at least three of the firm's business references; talk to employees who received training as well as to their managers.
- ✓ Request the trainers' resumes, and determine if they are full-time staff or contract workers (contract worker quality may be inconsistent).
- ✓ Inspect off-site training facilities for quality and adequate number of PCs.
- ✓ Ask for a detailed list of equipment, software, and other training materials the firm provides if training takes place at your office.
- ✓ Review all print, video, and software training materials for quality.
- ✓ Arrange for a pilot test or sample class before committing to a contract.
- ✓ Negotiate for revisions of training materials and/or follow-up instruction at no extra charge if training proves ineffective.

Everything you need to know about the difference between a Compaq PC with Intelligent Modularity and a merely upgradable PC.

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1. Five-board modular design	Yes	No	No	No	No
2. Upgradable video without using an expansion slot	Yes	Yes	No	No	No
3. Separate I/O board for potential enhancements and ease of service	Yes	No	No	No	No
4. 14 levels of security including cable-lock provision	Yes	No	No	No	No
5. System configuration and ID number available in memory and accessible remotely	Yes	No	No	No	Yes
6. Power supply adequate for all expansion needs	240w	150w	145w	220w	194w

Keeping track of what's inside each PC is easy with our built-in Asset Management provision. Each COMPAQ DESKPRO/M PC can tell you its serial number, how it's configured and what it has installed. Even remotely, over the network. A big time- and money-saver for MIS managers.

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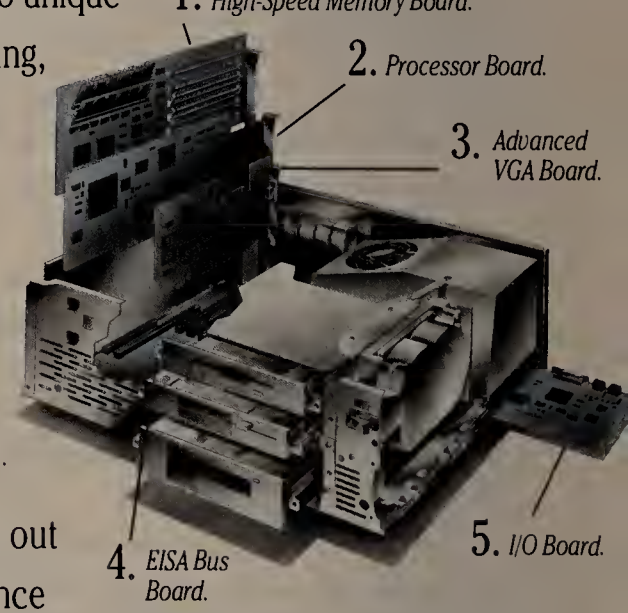
And, thanks to unique Compaq engineering, you get optimum performance no matter how you configure your system.



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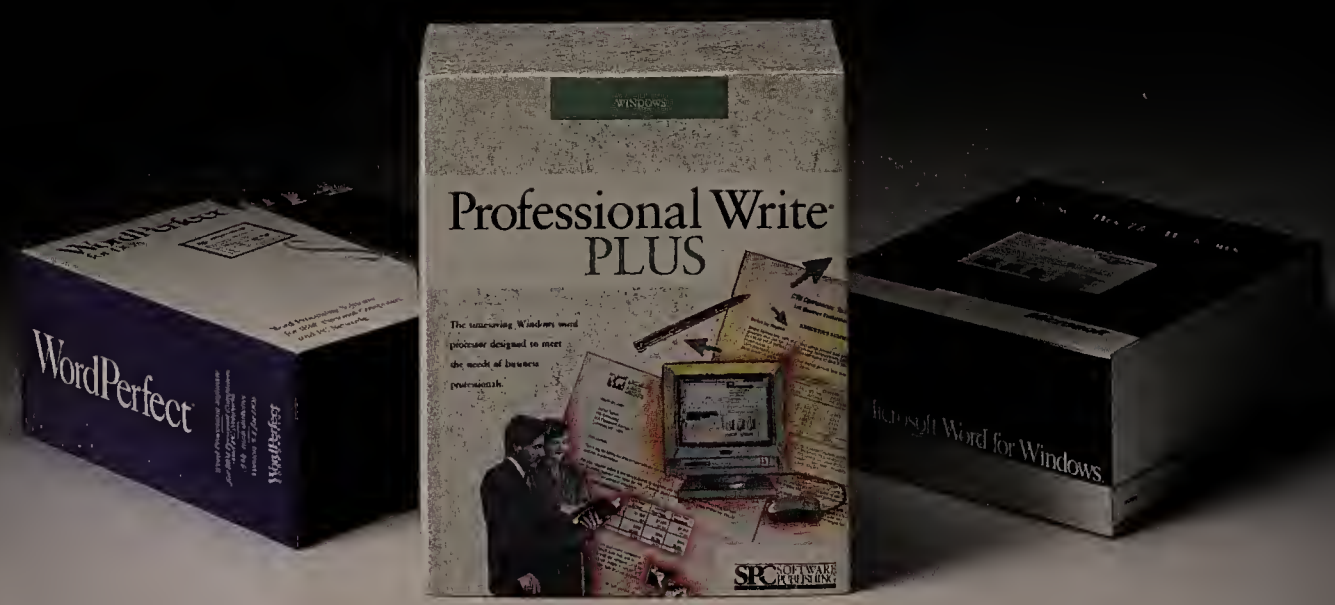

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Edited by ERIC BENDER

New Chips Offer More Than Price/Performance

War Begins Among 386 Compatibles

AMD, Chips and Technologies, IBM Aim to Outdesign Intel

Telebit's Benny Sun bought several network servers based on AMD's 40-MHz chip and "experienced no problems whatsoever."

ANDY FREEBERG

Battle lines are drawn for the CPU chip wars as clones of the 386 chip arrive in force.

Advanced Micro Devices (AMD), at press time the only manufacturer shipping a 386-compatible CPU, claims to have captured 10 percent of the 386 market. Chips and Technologies (C&T) has announced a family of 386 chips that will begin shipping early in 1992. IBM is showing a 386SX that almost doubles standard performance. Other vendors such as Cyrix and Nexgen should jump into the arena by midyear.

Analysts predict that Intel will not be able to halt this march with threats of legal action, and users will see faster machines at cheaper prices in addition to some tangible technical improvements. "These chips must be more than just faster and cheaper Intel clones," says David Carnevale, vice president of Infocorp in Santa Clara, California. Intel is responding with a flurry of new chip flavors, including innovations such as 486 CPUs that run twice as fast as the system clock.

Different Strokes

AMD, in addition to offering higher clock speeds at lower prices than Intel, specializes in CPUs that consume less power. "As a direct result, there are already laptops on the market with significantly enhanced battery capabilities at very affordable prices," says Dean McCarron, vice president of Instat in Scottsdale, Arizona. Meanwhile Intel has had problems shipping a bug-free 20-MHz 386SL—its low-power version of the 386SX—and a 25-MHz version hasn't yet arrived.

Chips and Technologies redesigned the basic 386 CPU from scratch and provided "a more efficient design," says Michael Slater, editor of the *Microprocessor Report* in Sebastopol, California. "At the same clock rate of Intel 386 CPUs, you will essentially have faster chips." More notably, the C&T family offers a feature called SuperState, which gives systems vendors a new way to design in features such as power management and automatic compression/decompression of files while avoiding incompatibility.

Chips and Technologies also announced a complete XT-on-a-chip called PC/Chip. "This will result in palmtops that provide about three times as much power as existing systems, at a greatly reduced price," says McCarron.

Performing on Price

Arche Technologies, which has been shipping systems based on AMD's Am386DX-40 since June, chose the chip on simple price/performance. "The price of the AMD 40-MHz chip was close to that of Intel's 33-MHz chip, but it greatly outperformed Intel's offering," explains an Arche executive.

Benny Sun, a programmer analyst at Telebit in San Jose, California, purchased several 40-MHz Arche systems to act as NetWare servers. He says that he is pleased with their price/performance and that he has "experienced no problems whatsoever."

AST chose AMD's 25-MHz 386SX chip for its lower power consumption and because at the time there was no Intel alternative. AST also will employ Intel's 25-MHz 386SL chip when that's ready, says Genelle Trader, director of portable systems marketing for the Irvine, California, firm. Trader expects that Intel will offer better performance but at a higher price.

Mo Chughtai, an information systems consultant at Mattel Toys in El Segundo, California, was unaware that the CPU in his AST Premium Executive notebook was a non-Intel part until he had used the system for several weeks. He believes most end users won't notice or care; their faith rests in the system vendor. "This is a very fast, very compatible machine," Chughtai says.

—Alice LaPlante

386-Compatible Chips Arrive

New sources of 386-compatible CPUs

AMD
CPUs: 386SX, 386DX
Strategy: Undercutting Intel on price; lower power consumption; special models for notebooks and laptops.

Chips and Technologies
CPUs: 386SX, 386DX, 8086
Strategy: Higher performance at given clock speed; "SuperState" programmability for power management, other functions; PC/chip allows powerful, cheap palmtops with long battery life.

IBM
CPU: 386SX
Strategy: An 8K internal cache plus optimized instructions, doubling performance of equivalent Intel CPU.

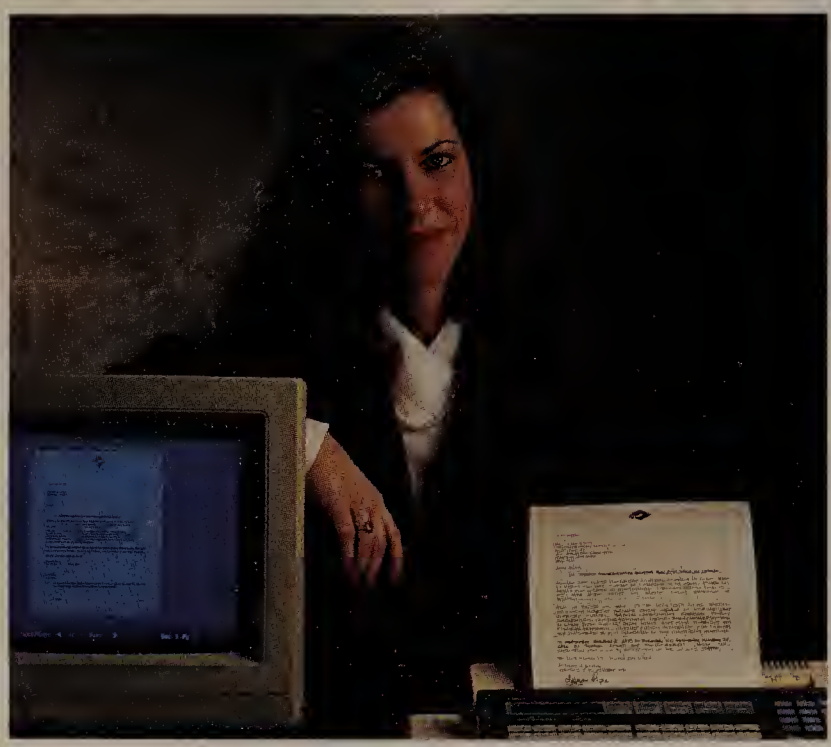
The floodgates have opened on 386-compatible chips, with three suppliers shipping or about to ship alternative CPUs.

Modem and Fax Finally Tie the Knot

Falling Prices, Emerging Standards Push Sales

Suddenly the friendly interest between PC users and PC-based faxing has turned into a whirlwind romance.

Take the case of Strohn Systems. Strohn, a Toronto value-added reseller, had used its Intel SatisFaxtion fax-modem only sporadically before last summer's Canadian postal strike. With 1000 seminar invitations to send and no way to mail them, marketing manager Charlene Smith wrote a *WordPerfect* macro that merged a three-page letter with prospects' fax numbers, and broadcast the lot from her PC. "Now that we know how, we plan to use it on a regular basis to keep in touch with our customers," says Smith.



A fax-modem saved the day for a Strohn Systems seminar by broadcasting invitations to prospects, says Charlene Smith.

CURT TRENT

Highly integrated chips have caused fax board street prices to dip toward $100—far below the cost of stand-alone fax machines. Users applaud the high image quality and convenience of PC-based faxes. Although a stand-alone fax unit often is simpler to operate, particularly if you're trying to send along something that's on paper rather than in electronic form (because you'll have to scan it in first), friendly *Windows* packages like *WinFax Pro* from Delrina in Toronto have eased the path for PC users.

Most important, "fax and data modems are becoming one," says Greg Lang, marketing manager for desktop products at Intel's Personal Computer Enhancement Division in Hillsboro, Oregon. It's getting hard to buy a fax board that won't act as a modem, and Lang predicts that by 1993, half the modems that are sold for stand-alone desktop use will fax as well. The total U.S. market will reach half a million units in 1992, predicts Judy Pirani, analyst at BIS Strategic Decisions in Norwell, Massachusetts.

A Second-Class Standard

A true market explosion awaits a standard that lets a wide variety of PC applications work with a wide variety of fax-modems. This standard is finally in sight.

The first shot at a standard was the Intel/DCA Communicating Applications Specification, which lets you send faxes from within any application that's been suitably modified, not just communications packages. But CAS won little backing from Intel's rivals or from software developers.

Next came the Class One specification, which calls for fax processing handled in software rather than in standard fax hardware. The trade-off is a decrease in performance, so the majority of vendors weren't impressed.

The new hope is Class Two, an emerging hardware/software definition "which permits independent software vendors to develop products that will fit a wide market rather than a specific manufacturer's products," says John Copeland, senior software engineer for Hayes Microcomputer Products in Norcross, Georgia.

Class Two promises an end to boards that work only with idiosyncratic software written by the board builder. Instead, a powerful mainstream package will be bundled, or you'll buy whatever you like separately.

The trouble with Class Two is, its language and definitions aren't precise; it's "a chocolate pudding standard—it's mushy," says Larry Purcell, vice president of Alien Computing of Palmdale, California, maker of *Faxit for Windows*. As a result, two incompatible versions have both gained adherents, so buyers still must check extremely carefully to ensure that specific software and hardware products will work together.

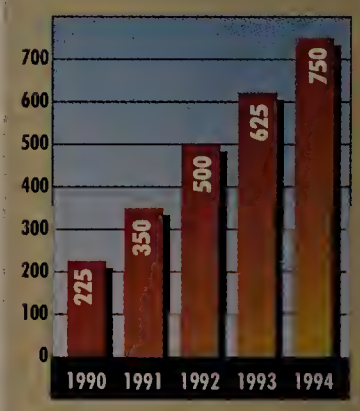
Embroidering the Fax

While software standards are being sorted out, computer fax is assuming new forms. One is multifunction peripherals such as Everex's LaserScript Fax, which merges PostScript printing with fax transmitting and receiving and even document copying. Plenty of vendors plan systems with similar twists, but BIS's Pirani questions whether users will snap them up; what happens, for instance, if you want to print while a fax is coming in?

The arrival of network fax raises other questions, in particular, how can gateways best distribute incoming faxes? But gateways save big bucks over stand-alone boards. And the ease of sending faxes from your workstation offsets any distribution handicaps, says Dave Deuchert, programmer analyst for Krack Corporation, an Addison, Illinois, equipment maker. Krack's NetWare net has a Facsys gateway from Optus Software of Somerset, New Jersey, that's "picking up speed all the time," says Deuchert. —*Mark Henricks*

Fax-Modem Shipments Boom

U.S. unit shipments, excluding network fax boards (in thousands)



Source. BIS Strategic Decisions

Cheap prices, friendlier software, and stabilizing standards are driving a rapid expansion in fax-modem sales, according to BIS Strategic Decisions.

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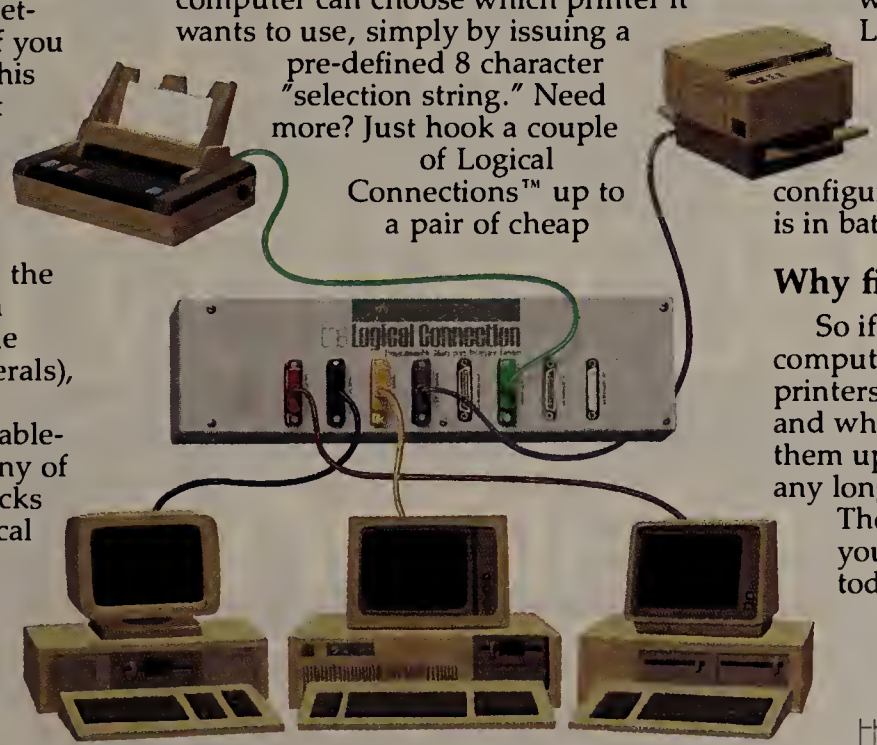

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Corporate Users Take Notes Seriously

Group Communications Package Speeds Daily Work

Users can build their own Lotus Notes applications for sharing information, and the applications tend to proliferate.

It's been a well-kept corporate secret, but *Lotus Notes* is about to start a parade on Main Street. With sales of the pioneer group communications package quietly snowballing among the Fortune 1000, Lotus plans a big marketing push behind *Notes*—the first package to successfully demonstrate that *group productivity* doesn't mean just fancy electronic mail. "It's become an integral part of the way we do business," remarks one enthusiastic user.

Notes is designed to let you share information with your work group—from the administrative assistant in the next cubicle to a sales representative in Italy. Technically, it's a text-based network data base with a graphical *Windows* or OS/2 front end and an OS/2 server back end. More important is what *Notes* does: enable nontechnical professionals to create amazingly effective applications that work across local or wide area networks. Popular examples include sales management, customer service, project tracking, executive information systems, and in-house electronic publishing.

Just Share It

Chemical Bank in New York invested in *Notes* for 300 information system employees. Now the bank is using *Notes* in project tracking, document preparation, internal information gathering and dissemination, and other tasks, says project manager Gail McGee.

In a *Notes* application that tracks all development projects, employees in one group are able to "look at other projects and see synergies that may not be obvious to other people," McGee points out. With *Notes*'s knack for group discussion, sometimes a meeting can be shortened "when we say, Let's not discuss this here—let's set up a discussion on *Notes*." McGee adds that a report becomes "a much more valuable tool" when it's distributed via *Notes*, because it can be searched or annotated later. Other groups in the bank are lobbying to install *Notes*.

Other users point out that *Notes* lets you link up with crucial contacts outside your organization—a customer in Houston or a supplier in Hong Kong—in ways that simply weren't possible before. For instance, a Texas company can get instant updates on the status of component shipments due from Japan. And a few organizations, like Patricia Seybold's Office Computing Group in Boston, are beginning to distribute selected high-value information to subscribers via *Notes*.

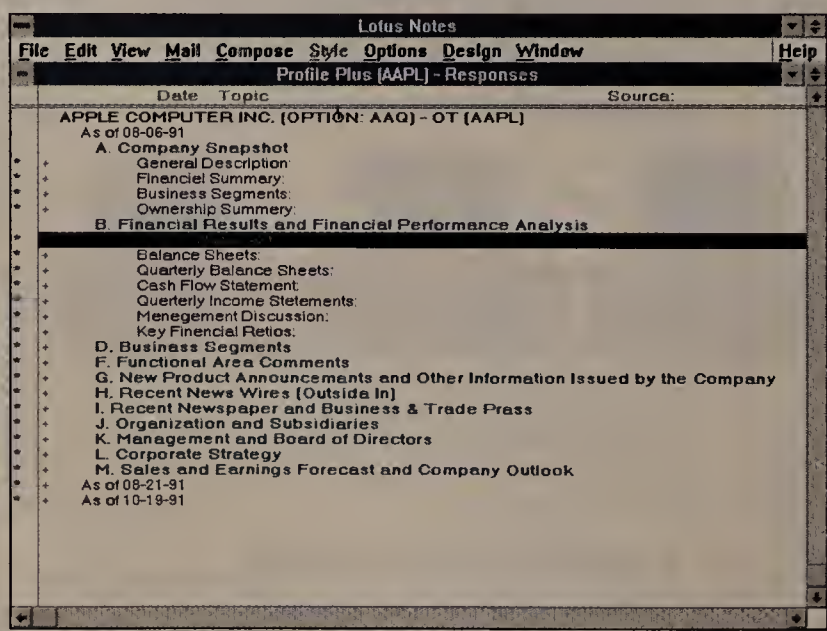
Notes for the Masses

Two years ago when *Notes* debuted, it would set you back a cool $62,500 for 200 users—minimum. Last spring when *Notes 2.0* shipped, Lotus extended distribution to selected value-added resellers, and the entry point began to drop. Corporate Software, for instance, offers a 5-user starter kit with training and support for $6360.

More than 80 firms are creating packages tuned to *Notes*. Some, like the Kodak/Lotus *Image-Enabled Notes*, add base functionality to the platform. Others add a new twist, such as *Quality at Work*, a package from Quality Management Decisions in Andover, Massachusetts that aims for "total quality management" throughout an organization. *Hoover*, from Sandpoint in Cambridge, Massachusetts, navigates what president Michael Kinkead calls "the electronic ocean: on-line data bases, broadcast news, CD ROM, and internal data bases." *Hoover*, he explains, "is a software agent that gets information from these sources, brings it back, parses it, and presents it in the user's context within *Notes*."

So far *Notes* has reached only about 100,000 users, analysts estimate, while Lotus's *cc:Mail* E-mail package broke the million-user barrier in 1991. But this year Lotus will put its muscle behind *Notes*, and IBM will comarket the product and build its back-end services into OS/2 nets.

Notes still lacks calendaring, true full-text search, and the underpinnings for applications designed to keep work flowing on schedule. It soon will be challenged by NCR's *Cooperation* and other group productivity entries. But currently, remarks Seybold vice president Dave Marshak, "for what it does, *Notes* has no competition." —*Eric Bender*



Sandpoint's Hoover, which retrieves external data in easily accessible form, is among a host of packages that run on Notes.

Mark Henricks is a PC World *contributing editor in New York. Alice LaPlante is a freelance writer in Palo Alto, California.*

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☐ **JOINT CREDIT** with another person. Complete entire application.

☐ **INDIVIDUAL CREDIT** but rely on income or assets of another person as a basis for repaying the credit requested. Complete entire application.

☐ **INDIVIDUAL CREDIT.** Do not complete Section C.**

**If you are a married Wisconsin applicant, you must provide your spouse's information as indicated, even though your spouse may not be signing the contract.

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☐ married ☐ unmarried ☐ legally separated

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Home Phone (_____) _____

Soc. Sec. No. _____ Date of Birth ____/____/____

Address _____ Apt. _____

City _____ State _____ Zip _____

Since? (Mo./Yr.) _____ ☐ Buy ☐ Rent ☐ Other _____

Previous Address _____

City _____ State _____ Zip _____

Employer _____ Since? (Mo./Yr.) _____

Monthly Gross Salary $ _____ Daytime Bus. Phone (_____) _____

Previous Employer _____ _____ From - To

Occupation _____

Income from alimony, child support or separate maintenance payments need not be disclosed if you do not wish to have it considered as basis for repaying this obligation.

Additional Monthly Income $ _____ Source: _____

Name & Address of Nearest Relative Not Living With You _____

_____ Relationship _____

B. CREDIT INFORMATION

PLEASE TELL US IF YOU HAVE: Checking Account ☐ Yes ☐ No
Savings Account ☐ Yes ☐ No

	Y/N	How Many?		Y/N	How Many?
Bank Loan	___	_____	Dept. Store Charge Card	___	_____
VISA	___	_____	Credit Union Account	___	_____
MasterCard	___	_____	Other Major Charge Cards	___	_____
Finance Company Loan	___	_____			

C. JOINT APPLICANT INFORMATION

Joint Applicant's Name _____

Soc. Sec. No. _____ Date of Birth ____/____/____

Address _____ Apt. _____

City _____ State _____ Zip _____

Home Phone (_____) _____ Date of Residence _____ (Mo./Yr.)

Joint Applicant's Employer _____ Since? (Mo./Yr.) _____

Bus. Phone (_____) _____ Monthly Gross Salary $ _____

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Date _____

Joint Applicant's Signature _____

Date _____

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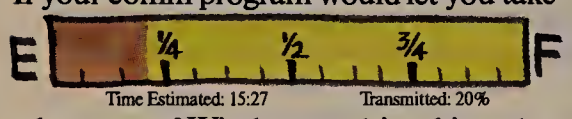
Circle 324 on reader service card

How To Get Into PC Communications Without Jumping Out Of Windows

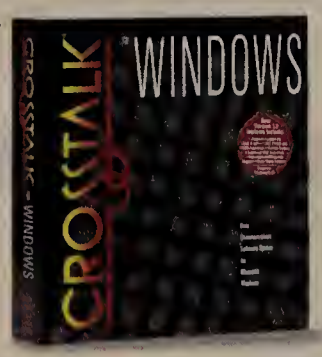
You forget how wonderful Windows™ is until you have to exit it to transfer a file.

Since most communications software won't work in Windows, you're left sitting on your hands watching a "gas gauge" as your file transfer crawls from start to finish. If your comm program would let you take



advantage of Windows multi-tasking, then you could minimize it to a simple icon while you carried on with something else (like the spreadsheet you promised your boss an hour ago).

Well, with Crosstalk® for Windows you can.



It's All In The Background.

Not only does it keep you in the point-and-click world of Windows, but more importantly, it lets you establish connections, and send and receive files–*all* in the background. In fact, while you're busy on another project, Crosstalk for Windows can be answering calls, dialing a queue of numbers, transferring data or keeping a VAX® link open. Think about it.

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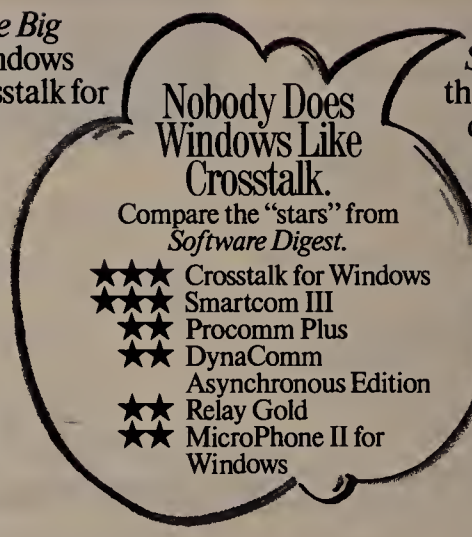

"Product of the Year." *Software Digest* called it the "Best of the graphical communications packages." And *PC Magazine* told Windows shoppers, "If you're a Windows fan shopping for a communications package, Crosstalk for Windows is a sure bet."

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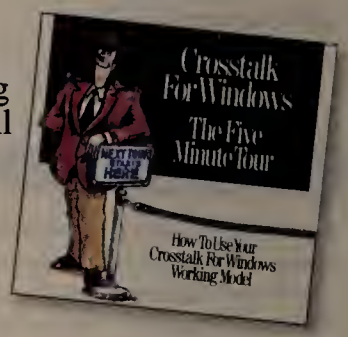

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Crosstalk for Windows really is one of the most versatile communications programs on the market today. It supports the most popular protocols and emulations, including ZMODEM and VT™220/ VT320. It can access shared modems on LANs and also supports high-speed modems. Yet, it uses only 150K RAM. *Info World* named it

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Reprinted from Software Digest Ratings Report, Vol. 7, No. 12.

Software Digest ★★★ Vol. 7 No. 12 1990 Crosstalk for Windows

1990 Crosstalk for Windows

Circle 84 on reader service card

Color and Light: The New Color Notebooks

Color notebooks—lightweight, compact, battery-powered, and delivering VGA hues in all their glory—are poised to make their appearance in the marketplace.

The Sharp PC-6881 will probably be the first notebook available with an active-matrix color screen. The result looks better than a standard VGA monitor.

ROBERT CARDIN

Lincoln Spector

If you're a typical *Windows* user, the colors on your monitor not only serve to enliven your work, they may even help you distinguish a credit from a debit. But when you take your work on the road, you must sacrifice these lovely and useful colors in order to get the small size, the light weight, and the battery-powered operation of a notebook.

But perhaps not for long. This past October, while attending COMDEX Fall in Las Vegas, I set out in search of the elusive color notebook. I found prototypes of four 256-color VGA notebooks: Sharp's PC-6881, Epson's NB-SL/25C, AST's Premium Exec 386SX/25C, and the Dell System 325NC. The best of them, the Sharp and the Epson, showed colors as bright and sharp as the best multisync monitor but without a multisync's flicker. The old refresh problems of standard LCDs—move the mouse and the cursor disappears from the screen—were solved. The flat screen finally moves faster than the eye.

When will the real notebooks arrive? Three of the four manufacturers told me their notebooks would ship in the first quarter of 1992, but they also said that their competitors' products would be late. Epson was the exception—and probably the most honest—promising only a second-quarter ship date.

When they finally do come out, color notebooks won't be cheap. The prices quoted ranged from "under $5000" to "$7549" to "we don't want to say just yet."

If you make traveling presentations, justifying that kind of expense shouldn't be difficult. The best flat displays look as good as VGA monitors and are perfect for showing small groups why your company or department is better than the others. Even a comparatively inexpensive color notebook can

SNAPSHOT

Sharp PC-6881

Sharp's super-lightweight color notebook boasts a beautiful screen as well as a built-in trackball.

KEY FEATURES

- **Thin Film Transistor active-matrix color screen**
- **Built-in trackball**
- **PCMCIA card slot**
- **5.5 pounds including battery**

AVAILABILITY

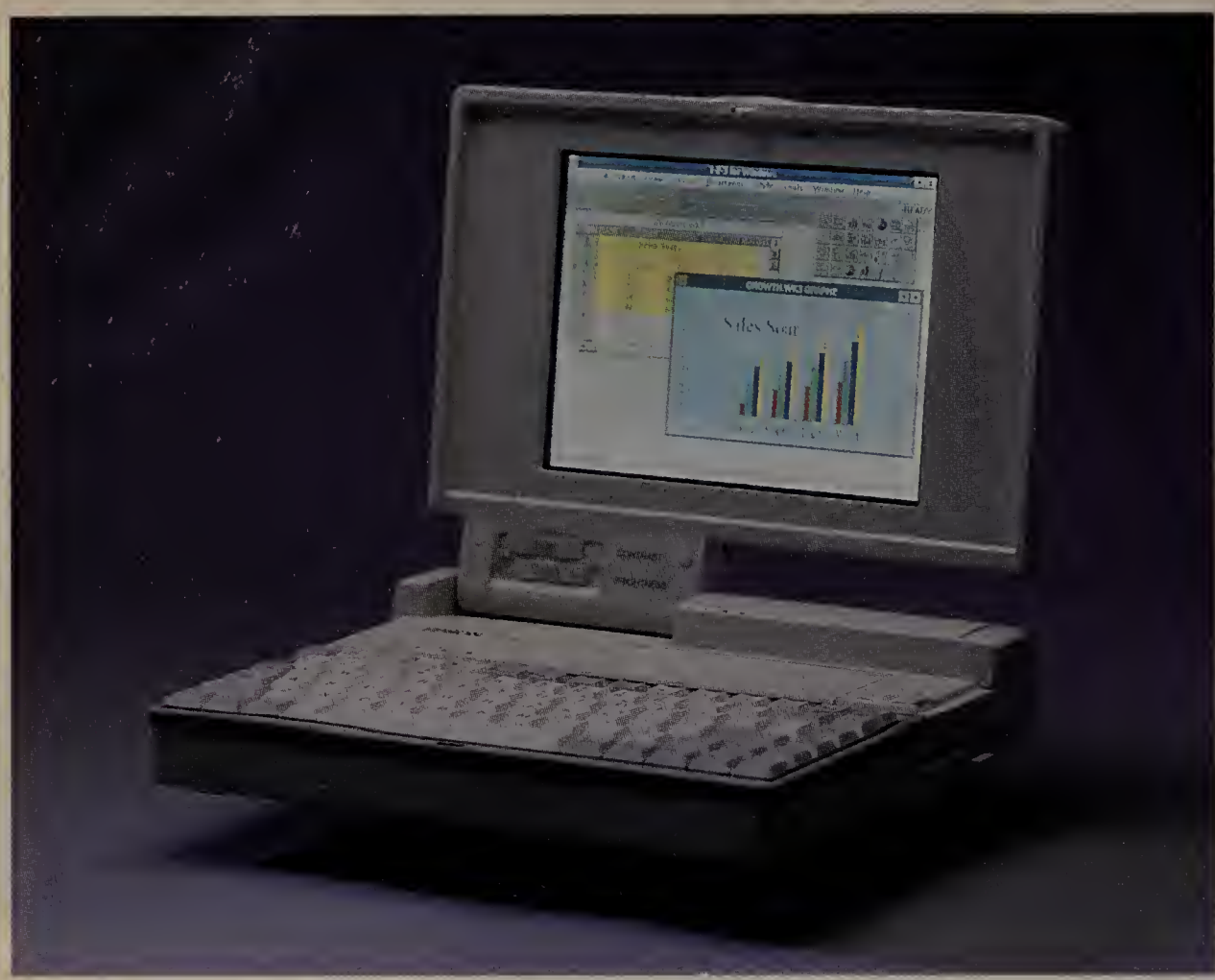
First quarter 1992

PRICING

Not available

Sharp Electronics
Sharp Plaza
Mahwah, New Jersey
07430
800/237-4277

Reader service no. 718



Epson's active-matrix notebook, the NB-SL/25C, is highly upgradable. Even the color screen can be an upgrade from the monochrome model.

GREG PRESTON

be a blessing if you use colors to distinguish part of your spreadsheet or if you must redesign a slide while flying to meet a client.

Behind the Screen

The major difference between expensive and not-quite-as-expensive color notebooks is the color LCD technology used. You don't need to understand the technical details of active- and passive-matrix LCDs (see "Inside an Active-Matrix Color LCD," February 1991, page 78, if you feel you do), but you should know that active-matrix screens look much better, while passive screens cost less to make and use much less battery power.

No matter what kind of screen they had, all the color notebooks I saw used an Intel 386SL processor to extend battery life—an important issue even for passive-matrix notebooks. At this point, no one is sure how effective a power-saving tool the SL will be, but all four laptops claim 2 to 3 hours of battery life with all power-saving features on.

The Sharper Image

Active-matrix machines will undoubtedly be the elite of the notebook scene, and Sharp's PC-6881 is about the ritziest way to travel while keeping your baggage light. Not only does this 5.5-pound system come with a spectacular active-matrix color screen, but in addition, its built-in trackball will spare you the hassles of carrying—and finding a place to roll—a mouse. And just in case Sharp and BIOS designer Phoenix Technologies find a better way to use the SL's power-saving features, they've incorporated a BIOS chip that can be upgraded through software.

What's more, the Sharp comes with a Personal Computer Memory Card International Association (PCMCIA) slot, an up-and-coming standard interface for credit card–size expansion options. The number of PCMCIA cards available is small, but it includes several memory cards and at least one modem. As the standard catches on, it should give notebooks the type of third-party hardware expandability that AT-style expansion slots have given desktop systems for years.

If you want to upgrade the CPU, however, forget it. And you may want to with this unit: Of the four color notebooks I saw, this is the only one with a 20-MHz SL chip—the others all had faster 25s.

So how much will this beautiful color notebook cost you? As we went to press, Sharp wouldn't provide even a ballpark figure. But to give you some idea of what the price is likely to be, a company representative did say that the 6781, a monochrome sibling of the PC-6881, will list for something under $5000. For active-matrix color, you'll pay considerably more.

An Active Alternative

Epson's active-matrix color notebook, the NB-SL/25C, will also cost considerably more than its monochrome sibling, but at least we know how much more. Configured with 4MB of RAM and a 60MB hard disk, the 7.3-pound NB-SL/25C will list for $7549; the monochrome NB-SL/25 will list for $4899 in the same configuration.

In order to keep costs and battery drain down, Epson will be using a new, proprietary active-matrix technology, Metal Insulator Metal, in place of the more traditional Thin Film Transistor technology that Sharp will have. Does it look as good? I didn't get a chance to put the two systems side by side, but I would be hard-pressed to say one screen looked better than the other.

SNAPSHOT

Epson NB-SL/25C

Epson's new active-matrix technology produces Thin Film Transistor–quality screens while keeping costs and power consumption relatively low.

KEY FEATURES

- **Metal Insulator Metal active-matrix color screen**
- **Easily changable, upgradable hard disk**
- **Upgradable screen**
- **20MB RAM capacity**

AVAILABILITY

Second quarter 1992

PRICING

With 4MB of RAM and no hard disk $6529; 40MB hard disk $720, 60MB hard disk $1020, 80MB hard disk $1320

Epson America
20770 Madrona Ave.
Torrance, CA 90503
800/922-8911

Reader service no. 719

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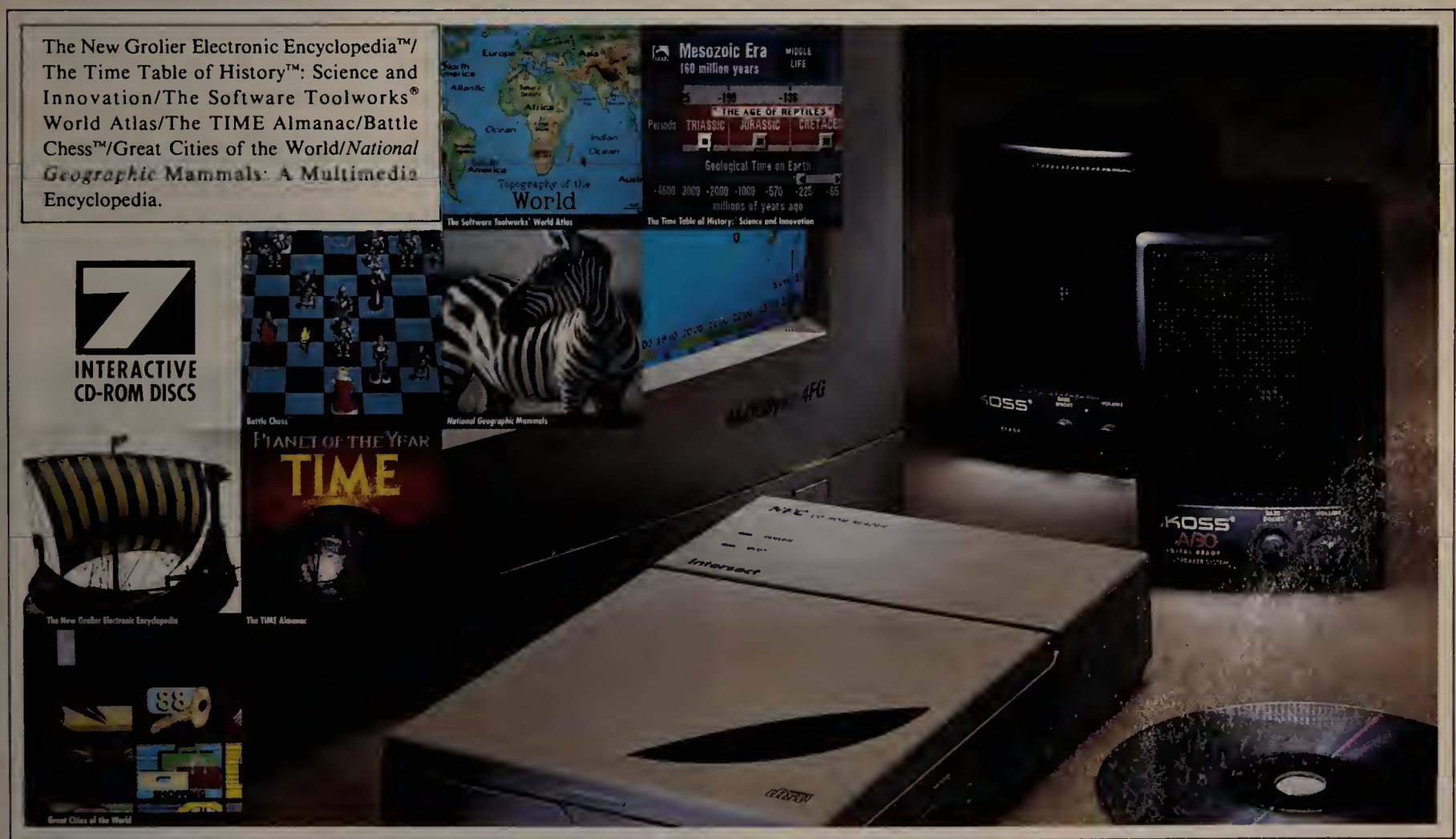

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C&C Computers and Communications

Circle 203 on reader service card

It's no match for active matrix, but the AST Premium Exec 386SX/25C may push the envelope on passive-matrix quality.

Epson's notebook won't come with a trackball or PCMCIA slot, but it's still quite upgradable. The 40MB, 60MB, and 80MB hard drives will be as easy to change and replace as the battery, and the Epson accepts a full 20MB of RAM. Even the screen is upgradable. If you buy a monochrome NB-SL/25, you'll be able to install a color screen at any Epson service center.

SNAPSHOT

AST Premium Exec 386SX/25C

AST's color notebook uses slower, less bright passive-matrix technology to keep the price down.

KEY FEATURES

- **Passive-matrix color screen**
- **Choice of 60MB or 80MB hard drive**
- **Lightweight AC adapter**

AVAILABILITY

January 1992

PRICE

With 4MB RAM and 60MB hard disk $4995; with 80MB hard disk $5295

AST Research
16215 Alton Pkwy.
P.O. Box 19658
Irvine, CA 92713-9658
800/876-4278

Reader service no. 720

GREG PRESTON

Passive Restraint

If you can't afford an active-matrix notebook, you can buy bargain color with a passive-matrix system. The colors won't be as vivid, the contrast will be lower, and the screen won't rewrite as fast as you'd wish (passive-matrix screens aren't as slow as monochrome LCDs, but if you move your mouse quickly, the on-screen pointer disappears). You will, however, be able to buy a color notebook for under $5000.

Their slow screens and subdued colors make passive-matrix notebooks a second-class choice for giving presentations, but if you design presentations, study graphs, or use color seriously to differentiate information, a good passive-matrix notebook is worth considering.

The pair of passive-matrix notebooks I saw at COMDEX —AST's 7.5-pound Premium Exec 386SX/25C and Dell's 6.9-pound System 325NC— are similarly priced machines that will surely compete head-to-head. The AST will list for $4995, and if other ASTs are any indication, it will sell on the street for considerably less. At press time Dell hadn't priced the 325NC but promised the notebook will sell for "significantly less than $5000." Both notebooks will come with 4MB of RAM (expandable to 8MB in the AST and 12MB in the Dell). If you buy an AST, you can choose between a standard 60MB or an 80MB hard disk; the Dell will come only with an 80MB disk.

No passive-matrix display can compete with the beauty of active matrix, but some are much better than others. The AST's screen was markedly superior to the Dell's, with higher contrast and a faster response. But AST has warned me that the shipping system may not have the same screen as the prototype.

Many questions about color notebooks still remain unanswered. What will they really cost? When the screens are mass-produced, will they look as good as the prototypes? And will the batteries really last as long as the manufacturers promise? *PC World* will soon take an in-depth look at these colorful carryables. Stay tuned.

Lincoln Spector is an assistant editor for PC World.

SNAPSHOT

Dell System 325NC

Dell's color notebook uses less-expensive, less-striking possive-matrix technology.

KEY FEATURES

- **Passive-matrix color**
- **Nickel-hydride battery**
- **Fax-modem slot**
- **12MB RAM capacity**

PRICING

Less than $5000

Dell Computer
9505 Arboretum Blvd.
Austin, TX 78759-7299
800/289-3355

Reader service no. 721

Dell's passive-matrix System 325NC won't do for professional presentations but could be cost-effective for color-hungry travelers.

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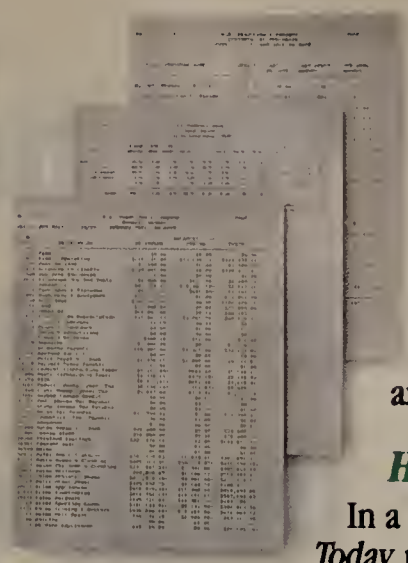

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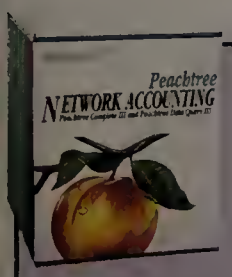

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Circle 144 on reader service card

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Computers and Communications

serial and parallel ports, a Super VGA CRT port, a mouse port, and an optional internal modem or fax modem. Not to mention an optional external battery slice for a total of over five hours of power. All of which permits it to perform feats far beyond the reach of ordinary notebooks, far from home.

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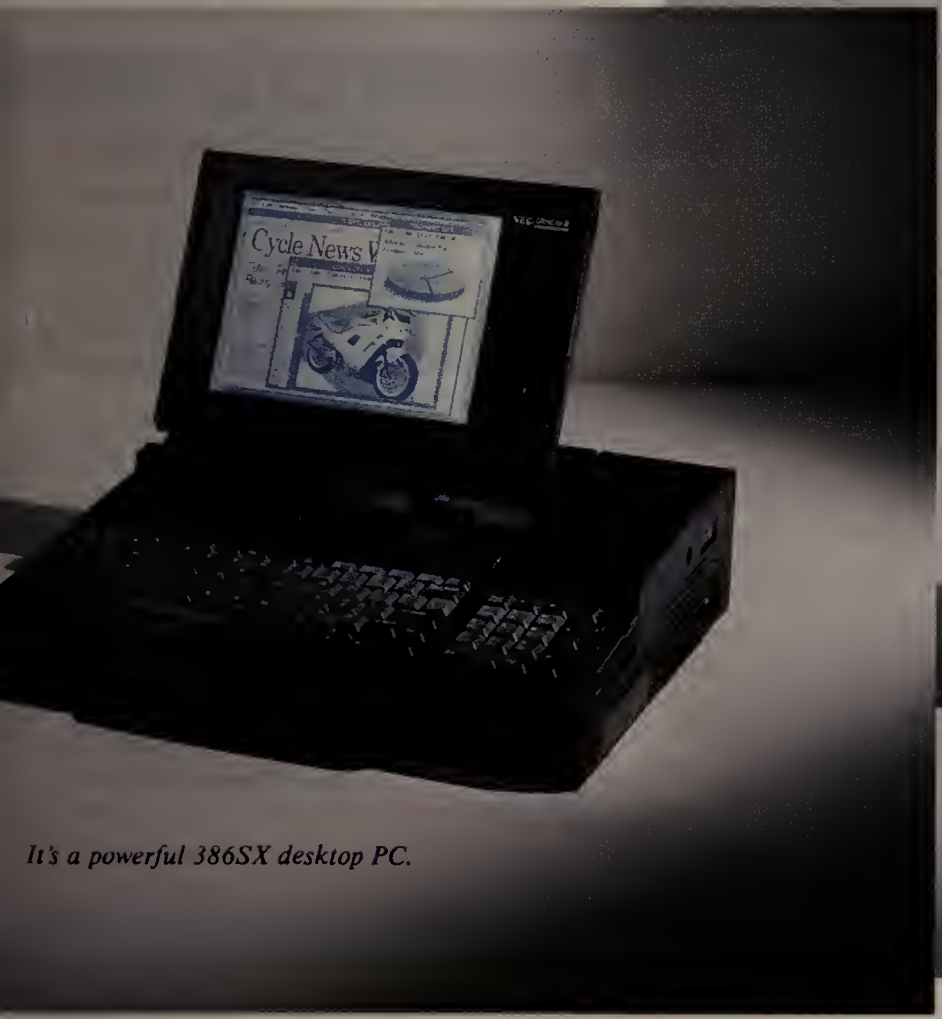

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- Dynamically allocated, field-expandable SIMM memory — 256 KB to 4 MB
- RJ-11 serial ports for snap-in cabling
- Any-port-to-any-port connectivity
- Any-port designation for printer or plotter
- Each port individually programmable
- Windows or DOS pop-up menu software for instant device selection and status
- Uses standard parallel PC-to-printer cables

12 any-to-any ports; buffered from 256 KB to 4 MB .....start at $795

GENERAL

PSU-82C/SP

Programmable sharing units for both serial/parallel printers, plotters and PCs. Designed for CAD/CAE, high-level graphics, Desktop publishing or general applications.

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- Separate baud rate, flow control, parity and messages for each port
- Pop-up menu software for easy printer/plotter selection
- Easy menu-driven configuration and set-up
- Prompt and response messages for plotter applications
- Support all laser printers including PostScript® printers and all types of plotters.

8 inputs; 2 outputs; buffered from 256 KB to 2 MB.....start at $595

QwikShare® III

Low-cost, expandable, all-parallel, high-speed printer sharing system. From one to 32 PCs independently share up to three remote and one local parallel laser/dot-matrix printer or plotter.

- Expandable to 32 PCs by adding Expansion Modules
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- All parallel port connections — PCs, printers and plotters
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Printer Server; buffered from 256 KB to 4 MB .....start at $295
Expansion Module with Printer Select Switch .....$149 ea.

QwikShare® II

Low-cost, buffered printer sharing. Supplied with Windows and MS-DOS device-select software which provides pop-up menus for easy printer port selection.

- 6 RS-232 serial inputs - RJ-11 connectors
- 2 user-selectable laser/dot-matrix printer ports
- Expandable memory to 2MB using SIMMS
- Input speeds up to 115K baud

6 inputs; 2 outputs; buffered from 256 KB to 2 MB.....start at $295

BASIC

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Circle 325 on reader service card

Lotus Write: A Slimmer Ami Pro

Lotus's new executive word processor is leaner yet strong.

Lotus Write gives you many of the powerful features you'll find in Ami Pro 2.0—such as customizable icons, a flexible ruler, and style sheets—at a lower price.

Bronwyn Fryer

With its full complement of hot editing and desktop publishing features, *Ami Pro 2.0* can be positively daunting to people who need less power. Enter *Lotus Write*, a coach-class version of *Ami Pro 2.0* with first-class service. This product combines basic word processing capabilities with *Ami Pro 2.0*'s sweet interface.

Like Symantec's *JustWrite* and Software Publishing Corporation's *Professional Write Plus*, *Lotus Write* is for users who want a solid *Windows* word processor but seldom use the desktop publishing features becoming standard in high-end products. While *Lotus Write* lacks *JustWrite*'s table of contents and tables and *Pro Write*'s integrated grammar checker, it makes up for these failings with other strengths, like flexible icons and a powerful outliner.

Amiable Behavior

Lotus Write inherits almost all the succulent features of *Ami Pro 2.0*, starting with customizable icons for access to frequently used functions. As in *Ami Pro*, you can move the icons or click them out of the way. You also get all four of *Ami Pro 2.0*'s editable display views, and the product ships with Adobe Type Manager (ATM), so output will be crisp. Moreover, the same collapsible outliner enables you to organize documents quickly, and the powerful spelling checker and thesaurus help you prevent embarrassments.

If you do occasional layout work, you can use click-and-drag frames for inserting graphics. You won't get the drawing and charting features of *Ami Pro*, but your consolation prizes are a clip-art library and easy importing of just about any graphics file.

To create professional-looking documents fast, you can choose from a dozen business templates. You can combine footnotes and endnotes into your document and use a mail-merge function when you're writing form letters. You can import files on the fly from many major word processing, data base, and spreadsheet programs. A built-in macro recorder makes it easy to record and play back macros.

Lotus Write even supports Object Linking and Embedding (OLE), so you can work with other applications and files from within your document, updating both at the same time. For example, to read your mail or send *Lotus Write* documents, you can access *cc:Mail* or *Lotus Notes* from within *Lotus Write*.

So what's lacking? Besides heavy-duty charting and drawing features, Lotus has withheld *Ami Pro*'s loftiest editing capabilities, such as tables, automatic index and table of contents generation, sorting, revision marking, and document comparison. Neither will you find *Ami Pro*'s *power fields* (variables you can embed in your document) nor its image processing knacks.

But if you're looking for a friendly, everyday program with an easy upgrade path to boot, *Lotus Write* may be just the ticket.

Bronwyn Fryer is an associate editor for PC World.

SNAPSHOT

Lotus Write

WINDOWS This executive word processor gives everydoy users a lot of powerful feotures along with o snazzy ond friendly interface.

KEY FEATURES

- **Customizable icons**
- **Outliner**
- **Macro recorder**
- **Spelling checker, thesaurus**
- **Adobe Type Manager**

AVAILABILITY

February 1992

PRICING

$199, upgrade to Ami Pro 2.0 $149 (upgrade prices from competitive products unavoilable at press time)

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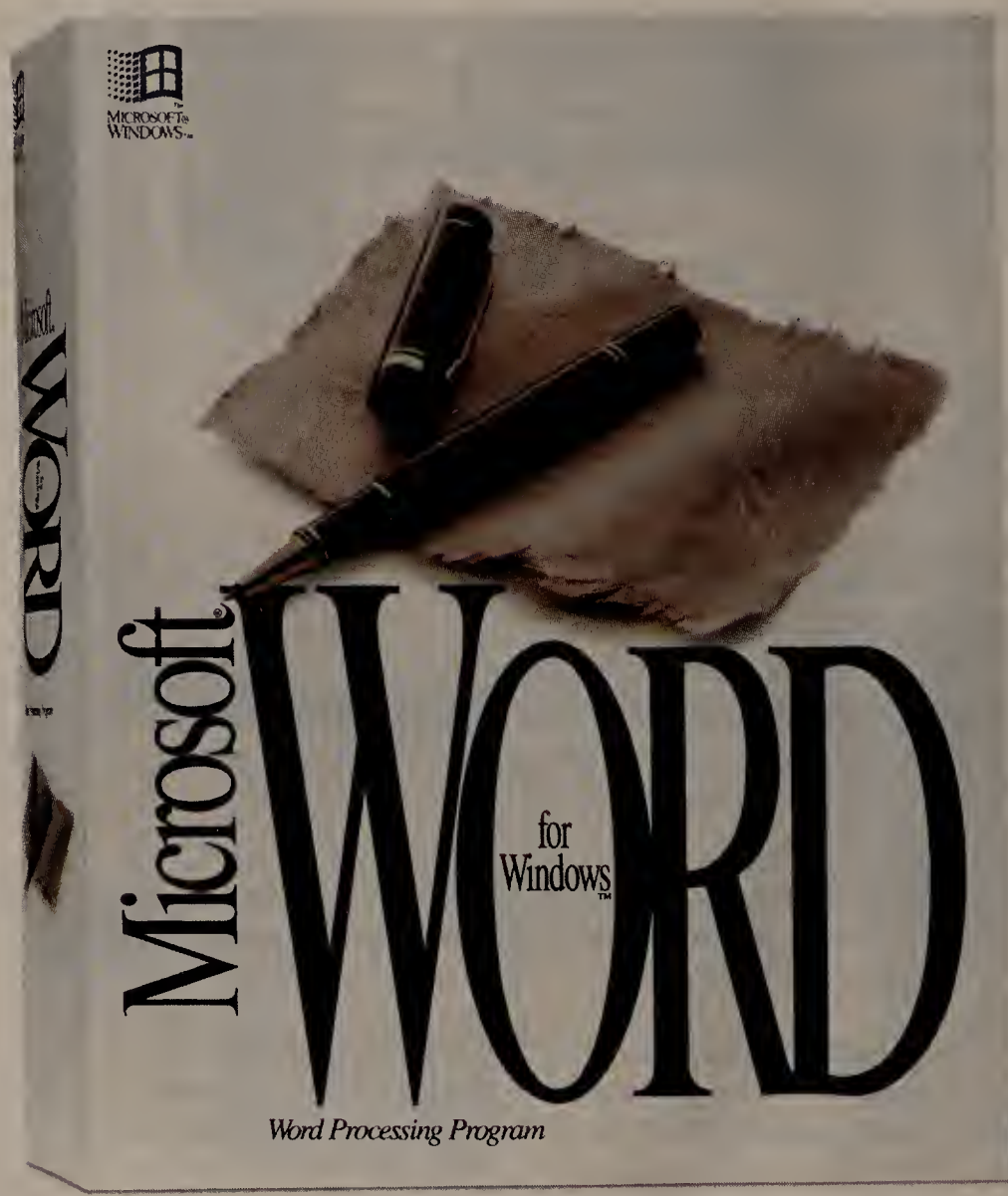

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Compaq Does a Power Lunch Box

The Portable 486c offers heavyweight performance without compromise but at an equally heavy price.

Offering 486 power and an active-matrix color screen that's better than a standard desktop VGA monitor, Compaq's Portable 486c weighs in at almost 18 pounds.

Mike Hogan

Compaq does nothing half way, so you can be sure that the *c* in Portable 486c stands for *color*, not *compromise*. But be ready to pay.

No flirting with second-best like passive-matrix color technology. This power portable travels first cabin with a screen that's better than any VGA-quality CRT: Its Sharp active-matrix liquid crystal display serves up 256 colors simultaneously from a palette of 4096 in VGA mode, along with a wide view.

The 10-inch diagonal display sits in a panel that tilts out from the lunch-box–style unit. Compaq's advanced graphics system speeds up screen response and can drive the display and an external monitor at the same time—important for presentations.

Powered by a 33-MHz 486DX CPU, the Portable 486c ships with 4MB of RAM, expandable to 32MB with standard SIMMs. In addition to the 1.44MB floppy, you choose between a 19ms 120MB or a 12ms 210MB hard drive. There are even two 32-bit EISA slots and a half-sized modem slot—more slots than offered by current competitors or those machines announced for first-quarter release.

Weighty Concerns

Unfortunately, all this oomph doesn't travel without a little uuhmph. Compaq says the 17.6-pound Portable 486c is "substantially lighter than many 386-based units," however, Toshiba's market-leading T3200SXC weighs a tad less. The year-old T3200SXC packs only a 20-MHz 386SX and an active-matrix display with fewer colors in VGA mode. But the T3200SXC is also about $2700 cheaper.

Still, you may just be one of those champagne-wishes-and-caviar-dreams travelers who can't live without a 486 CPU and EISA expansion slots. Specifically, you may be an architect, engineer, or software developer with disk- or graphics-heavy applications such as CAD, financial modeling, or desktop presentation.

The Portable 486c's 5.5-by-15.6-inch footprint and 11-inch height make it ideal for presentations. It's multimedia-ready, with a SCSI port for a CD ROM player, an audio input jack right next to a slot where a sound board can be added, and front volume control.

Naturally, there's also a full complement of mouse, parallel, serial, and external VGA ports. And no 80-something keys for Compaq. This portable gives you a full 101 keys on a detachable keyboard.

With its ample power and storage, and better-than-CRT color, the Portable 486c could easily replace your desktop. But if you don't have CAD-sized applications, you'll probably prefer one of the slim new color notebooks backed up by a docking station.

Mike Hogan is a senior editor for PC World.

SNAPSHOT

Portable 486c

With Compaq's top-of-the-line portable, you can have it all—including high performance, 101-key keyboard, and excellent color screen—but you pay the price in cost and weight.

KEY FEATURES

- **Active-matrix color LCD**
- **VGA resolution with 256 colors from a palette of 4096**
- **33-MHz 486 processor**
- **120MB or 210MB hard drive**
- **Two EISA slots, proprietary modem slot**

AVAILABILITY

Immediate

PRICING

Model 120 with 19ms 120MB hard drive $9999; Model 210 with 12ms 210MB hard drive $10,999

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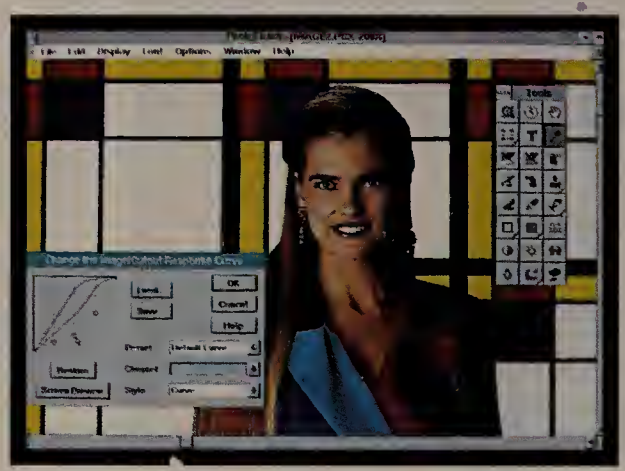

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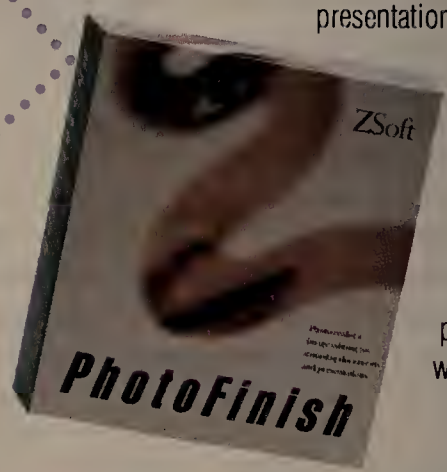

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CODE 4B

Circle 320 on reader service card

Sampo Notebook Blazes Ahead

The Valet SXL 25 is trimmer and lighter and goes further on batteries than the first 25-MHz notebooks.

Sampo's Valet SXL 25, here with 5-hour add-on battery, packs high performance in a small package.

KIRK AMYX

Phil Lemmons

Sampo's Valet SXL notebook charges ahead in the race to bring you 25-MHz performance in a light, compact package with a tiny appetite for power.

Like the AST Premium Exec 386SX/25, previewed in November, the Valet SXL uses AMD's AM386-SXL-25 to speed processing and prolong battery life. But Sampo's machine weighs 14 ounces less at only 6 pounds 2 ounces, is a third of an inch thinner at 1.89 inches, and throws in a send/receive fax-modem for the same list price as the AST.

Sampo claims the Valet SXL has a battery life of 5 hours in ordinary use. Competitor AST claims 3-hour battery life for its 25-MHz notebook. An optional 2-pound 4-ounce battery pack that screws into the back of the Valet provides 5 more hours of use, as does an optional replacement internal battery pack, according to Sampo. In short, the Valet is not only just as fast as its rival, it's trimmer, lighter, and goes further on batteries.

The standard Valet SXL comes with a 60MB hard disk, 4MB of memory expandable to 8MB, a 2400-baud modem that sends and receives faxes at 4800 baud, *Quicklink* communications software, and battery-check software that works with *Windows*. The standard model lists for $2995; with an 80MB hard drive, it's $3495. (In contrast, AST's 25-MHz Premium Exec 386SX/25 Model 63V/4, which lacks a fax-modem, listed at press time for the same price with 4MB of memory and a 60MB drive, or $3295 with 4MB of memory and an 80MB drive.) Sampo will also offer a 120MB drive version, but prices were not available at press time.

Notes From a Notebook User

How does the Valet SXL compare in use to a leading member of the previous generation of notebooks? Although the Valet weighs the same as the older Toshiba T2000SX I take on the road, they differ in most other respects.

The Sampo machine is a good inch smaller in width and depth and a half-inch thinner, fitting easily into a briefcase. But the Toshiba's nickel hydride battery recharges in about an hour. The prototype Valet SXL takes about 3 hours to recharge its nickel-cadmium battery.

When it comes to running *Windows*, the 25-MHz Valet SXL was the clear performance winner; higher clock speed is the obvious explanation. While you can easily lose *Word for Windows'* cursor in the T2000 display, the Valet's 9⅝-inch LCD with VGA resolution and 32 levels of gray keep the cursor clear. Indeed, even with *Word, Excel, Windows Calendar,* and *Paintbrush* loaded simultaneously, performance was excellent, and the suspend/resume button never failed.

All in all, Sampo's Valet meets your every demand for work on the road: light weight, long battery life, built-in communications, and full *Windows* capability.

Phil Lemmons is PC World's *editor in chief.*

SNAPSHOT

Valet SXL 25

Sampo's entry raises the bar for 25-MHz notebooks.

KEY FEATURES

- **25-MHz, low-power AMD SXL processor**
- **6 pounds 2 ounces**
- **60MB, 80MB, or 120MB hard drive**
- **32 shades of gray on 9⅝-inch VGA LCD**
- **Send/receive fax-modem**
- **Add-on battery pack for 5 hours additional use**

AVAILABILITY

January

PRICING

With 4MB RAM and 60MB drive $2995; 80MB drive $3495

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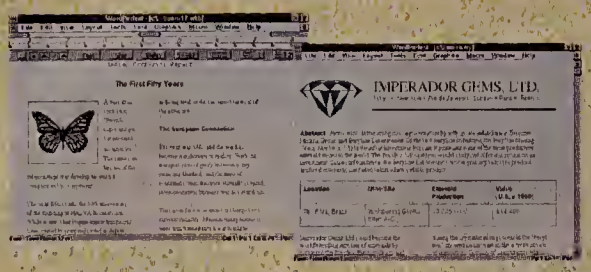

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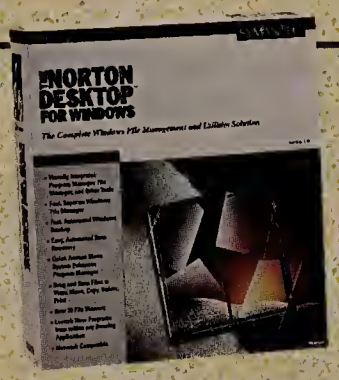

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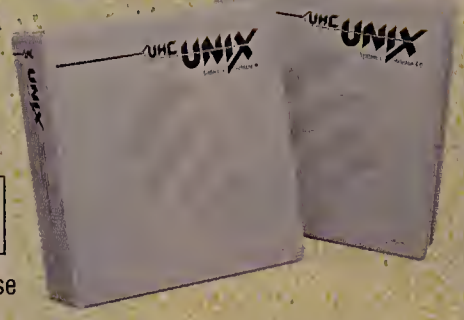

This major new release of UNIX operating system provides a wealth of new features and enhancements. It unifies the major variants of the UNIX operating system and also incorporates key features of Sun's SunOS system.

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Circle 156 on reader service card

Pen PCs: Mission-Critical Note Takers That Return to Basics

Pen computers come in many shapes and sizes, but all give you the choice to change the way you work.

Russell Glitman

This year will be marked by the emergence of pen computers in all shapes and sizes running a variety of operating systems. To profile this new era, we're previewing three machines that characterize the best of the pen breeds: the NEC UltraLite SL/20P, the Samsung PenMaster, and the Tusk All-Terrain SuperTablet.

Pen computing brings a revolutionary return to simplicity. It provides a way of using computers that is immediately familiar: With varying degrees of enthusiasm, we all grew up using pen and paper. The pen permits direct interaction with software, facilitates navigation, and creates a new data type—digital ink.

The operating systems for the new machines—Microsoft's *Windows for Pen Computing* and Go Corporation's PenPoint—are expected to ship in March. Microsoft's environment will enable existing *Windows* applications to become "pen aware"—that is, they will let you use a pen to replace a mouse, and in addition to using the keyboard, you can use the pen to fill in fields or write notes. PenPoint, on the other hand, is fostering new "pen-centric" applications designed to run without a keyboard or cursor.

NEC Pen PC

For finger-dipping into pen computing, the NEC SL/20P is close to ideal. NEC is targeting the traditional notebook buyer; indeed, it has a penless version of this 20-MHz 386SL machine for $4199. Spend an additional $300, and you get a pen, *Windows for Pen Computing*, NEC's *UltraDraw* sketch and drawing program, and voilà! you have a pen computer that gives you everything you could want in a notebook. If you opt for the notebook version and decide later you'd prefer the pen model, no problem. NEC will offer upgrades to the SL/20 for about $300—just bring your machine to a dealer.

In any case, the machine comes with 2MB of RAM (expandable to 8MB), a 16K memory cache, an 80MB hard drive, and a series of customizable power management features that NEC claims will provide up to 7 hours of battery life. The SL/20P is a bit larger and heavier than the smallest notebooks, weighing in at 6.8 pounds (6.4 pounds for the penless SL/20) and measuring 9 by 11.5 by 2.2 inches.

Using the pen on what was designed as a notebook screen is a little awkward; the pen functions primarily as a navigation tool. Since the SL/20P also comes with a touch screen, you may prefer to let your fingers do the walking around *Windows*—but you'll never need a mouse.

Writing on the 9.4-inch screen requires you to support the back of it. This requirement is aggravated by the necessity of applying constant pressure to the pen. Unless the pen tip is fully depressed, the VGA screen doesn't register ink. Final pen design and screen housing modification were still under debate at press time.

GREG PRESTON

If you're looking for a notebook but want to try out pen computing, the NEC UltraLite SL/20P is worth a drive.

Samsung's Super Slate

Samsung's PenMaster is the quintessential tablet pen computer. Company officials say it is designed for insurance, sales, real estate, and medical users who do most of their work on their feet or out of the office.

Although the PenMaster appears to be almost all screen, it's just 10 inches diagonal—typical for most laptops. A light 4.9 pounds, the PenMaster shares the NEC's 20-MHz 386SL processor and comes with 4MB of RAM (expandable to 20MB) and a 16K memory cache. Samsung intends to offer a 25-MHz version once the chip is available, and you can upgrade the cache to 64K.

What sets the PenMaster apart from earlier pen tablets, such as NCR's 3125 and Grid's GridPad, is the huge amount of hard disk space Samsung

SNAPSHOT

NEC UltraLite SL/20P

The SL/20P offers the benefits of both worlds—the familiarity of a keyboard and an entry to pen computing.

KEY FEATURES

- **20-MHz 386SL pen computer**
- **Touch screen**
- **3 to 7 hours of battery life**
- **Manually activated 0-MHz standby mode**
- **Fax annotation**

AVAILABILITY

Immediate

PRICING

SL/20 $4199, SL/20P $4499

NEC Technologies, Inc.
1414 Massachusetts Ave.,
Boxborough, MA 01719
508/264-8000

Reader service no. 713

Samsung's PenMaster is a 386SL tablet-style pen computer that weighs less than 5 pounds and runs up to 3 hours.

has packed into a trim case. Although PenMaster measures less than 1.5 by 11.5 by 9.3 inches, Samsung gives you the option of a 40MB, 60MB, 80MB, or 120MB internal hard drive. Like its tablet competitors, the PenMaster comes with a PCMCIA card slot, a standard interface for credit card–size expansion options. It also has floppy drive and keyboard ports, and Samsung offers a fax-modem card.

The PenMaster can run PenPoint and *Windows for Pen Computing* as well as *PenDOS*, a pen operating environment from Communication Intelligence Corporation. *PenDOS* enables you to use the pen as a mouse substitute with DOS applications and for limited handwritten data entry.

Writing on the VGA backlit screen is almost like writing on paper. The machine has simple, easy-to-find controls. Its tetherless pen slips neatly into a cradle on the front panel—perhaps too easily, since an unexpected knock could dislodge it.

Samsung claims a 3-hour battery life with all components except the optional keyboard and 3½-inch floppy disk operating continuously. The company expects to offer the machine for under $5000.

Four-by-Four Computing

The Tusk All-Terrain SuperTablet is a pen computer for your desk that you can also take with you—whether you're tapping into a corporate data base during a board meeting or taking notes in a driving rainstorm. This machine defines rugged: It's a water-resistant tablet composed of Spectra, a ballistic composite material; and its two 124MB hard drives are mounted in a secret ultrashockproof material the company claims changes from solid to liquid upon impact and then back to solid.

The tablet, or *roving unit*, as Tusk officials call it, has many special features; the most striking is the paper-white super-VGA screen from Hitachi that has extremely crisp resolution. Other innovations include pen-operated display controls and user-definable soft "keys" on the margin of the screen.

The 6.5-pound roving unit is powered by a 20-MHz 386SL and attaches to a 2.5-pound deskbound keyboard unit via a 200-pin AT bus connector. A 3½-inch drive comes with the keyboard unit, and both units have a full array of ports, including VGA, serial, parallel, and phone. The roving unit also snaps on top of the keyboard unit for carrying. Company officials claim a battery life of 2.6 hours with all components running. Price should be under $7000 when the machine ships in the first quarter of this year, and a 25-MHz version should also be available.

The Tusk can run PenPoint and *Windows for Pen Computing*, but its main advantage may be its ability to run just about anything just about anywhere.

Russell Glitman is executive editor for PC World.

SNAPSHOT

Samsung PenMaster

Samsung masters the tablet model with a pen computer that weighs less than 5 pounds and costs less than $5000.

KEY FEATURES

- **4.9 pounds**
- **120MB hard drive**
- **PCMCIA memory card slot**
- **16K memory cache standard**

AVAILABILITY

March or April

PRICING

Less than $5000

Samsung Information Systems America, Inc.
3655 N. First St.
San Jose, CA 95134-1713
800/624-8999,
408/434-5653 (fax)

Reader service no. 714

SNAPSHOT

Tusk All-Terrain SuperTablet

This four-by-four computer is as rugged as they come and includes a suite of innovative features.

KEY FEATURES

- **Super-VGA paper-white screen**
- **Water resistant**
- **Spectra ballistic composite case**
- **6.5 pounds**
- **No shock damage up to 180G**

AVAILABILITY

First quarter

PRICING

Less than $7000

Tusk Inc.
1310 Gateway Rd.
Lake Park, FL 33403
800/275-8875,
407/844 4351 (fax)

Reader service no. 715

Tusk's All-Terrain SuperTablet is the four-by-four of pen computers, featuring a water-resistant case.

GREG PRESTON

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15806 Midway Road
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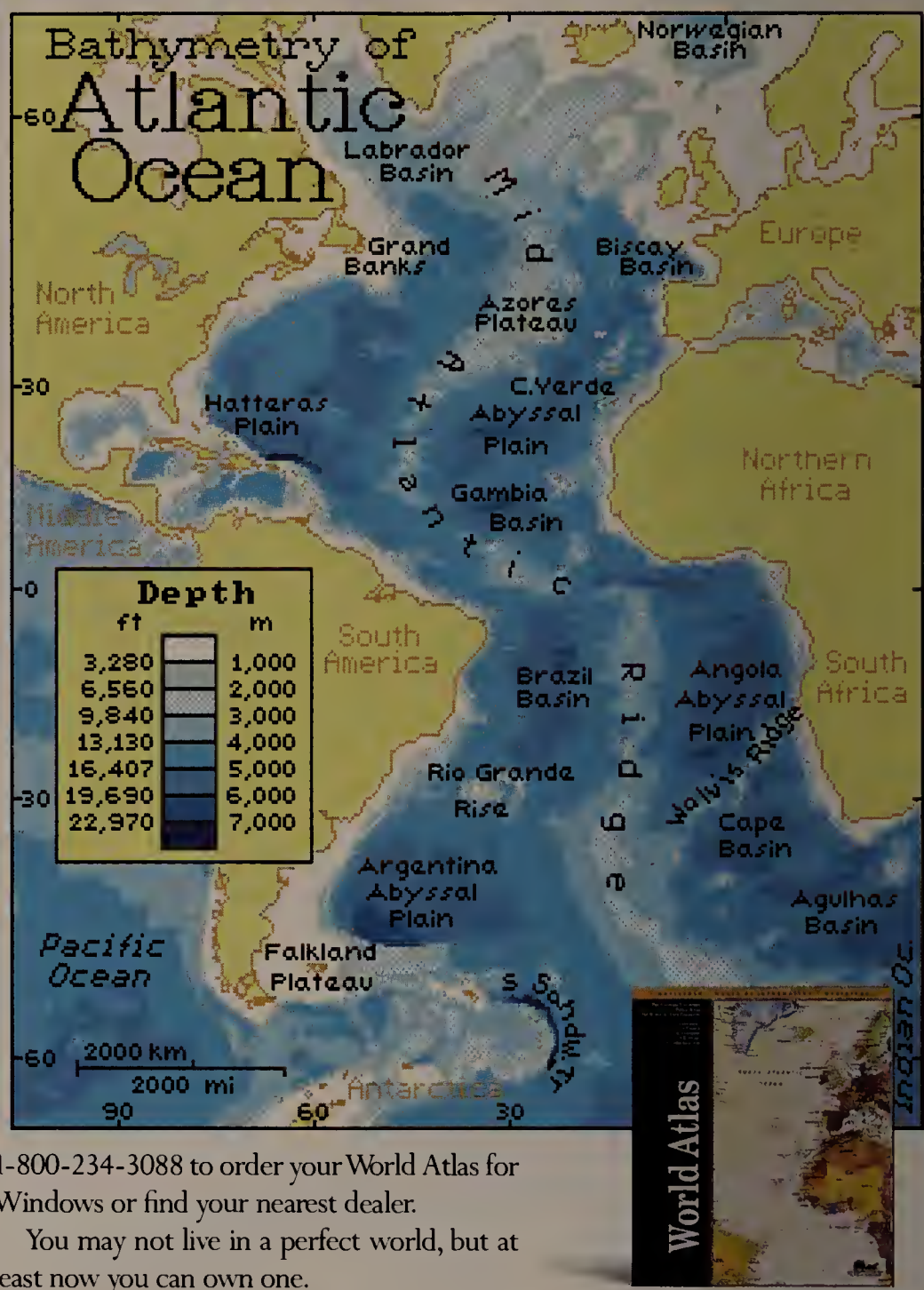

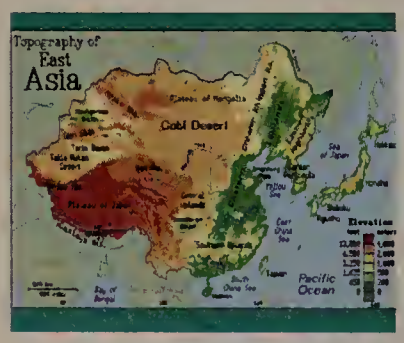

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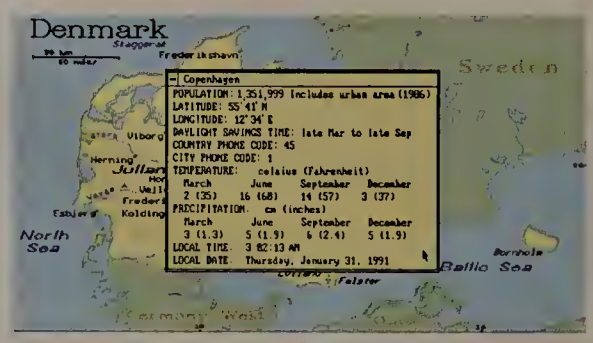

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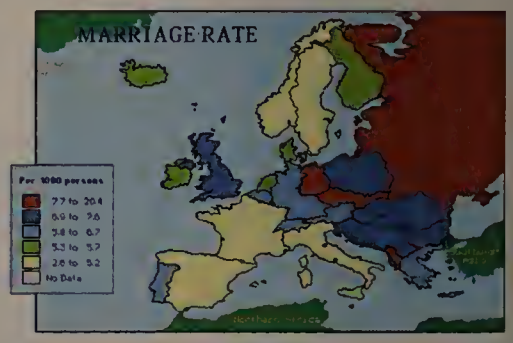

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Circle 270 on reader service card

A Processor Plus for PS/2s

Big Blue brews an attractive alternative to the 80386SX.

The 386 SLC processor upgrade board plugs into the Model 57's coprocessor socket to boost performance by 35 to 100 percent—but the chip's major role will be in new PS/2s.

DAN ESCOBAR

Eric Bender

The walls are crumbling around the PC industry's last monopoly, processors based on Intel's 386 chip. One of the most promising alternatives comes from Intel's traditional ally: IBM.

A kind of cross between a 386SX and a 486, the IBM 386 SLC performs almost twice as fast as the Intel equivalent at the same clock speed. IBM began with Intel's own SX design, added an 8K internal cache and cache controller, and optimized performance for the most common instructions. The result is pin compatible with the SX and Intel's power-optimizing SL and has even passed Intel's own software compatibility test suite.

Popped into a PS/2 Model 57 for preliminary tests, the 20-MHz SLC accelerated system performance dramatically, actually doubling throughput on one processor-intensive *1-2-3* test and posting an average gain of about 48 percent on our application benchmarks.

Pumping Up the PS/2

Give most vendors a new processor, and they slap it directly into a new system. IBM tends instead to preannounce a processor upgrade, which then trickles out for months until chip production ramps up and Big Blue can ship an out-of-the-box PS/2 in volume. That's the scheme with the SLC, currently offered only in a $780 upgrade for the 6-month-old Model 57 and as part of a special multimedia Model 57.

The Cached Processor Option is a playing card–sized board with an SLC (hiding underneath a heat sink) and a math coprocessor socket. You or your dealer simply plugs it, cautiously, into the 57's math coprocessor socket, which was designed with just this upgrade in mind. (Other PS/2s weren't, so there's no similar upgrade looming for the best-selling Model 55.) Run a quick reconfiguration program, and voilà! you have the world's fastest 386SX machine.

So IBM claims, and it may well be right. At press time *PC World* hadn't completed tests on the new crop of 25-MHz SX machines, but in many benchmarks the SLC-equipped Model 57 runs right with the pack of 25-MHz DX machines. In fact, it posts exactly the same time on our *WordPerfect 5.1* test as the October 1991 Best Buy Everex Step 386/25.

That's good news for buyers of the basic Model 57, which is no speed demon, but it's still well short of the price/performance frontier. List price for a Model 57 with processor upgrade and 80MB drive is $4405—in the same range as many 33-MHz 386 PCs. For that matter, AST's 20-MHz 486SX model costs less ($3495) with equivalent memory and storage.

There's no mystery about why IBM's share of the PC market plummeted in 1991. Generally you pay a little more money and get a little less performance, and regardless of technical merits, the Micro Channel bus strikes most potential customers as a minus. But Big Blue can still reach back into its formidable technology arsenal and come up with a compelling product. The SLC is on the right track: It adds value without subtracting compatibility. Let's hope the prices are right for the upcoming SLC machines.

Eric Bender is East Coast editor for PC World.

SNAPSHOT

PS/2 Model 57 Cached Processor Option

Reinventing the 80386SX to double performance, IBM offers a board that accelerates applications on the Model 57 by 35 percent or more.

KEY FEATURES

- **Powerful SLC chip with on-chip cache and optimized instructions**
- **Upgrade plugs into coprocessor slot**

AVAILABILITY

January 1992

PRICING

$780

IBM
Old Orchard Rd.
Armonk, NY 10504
800/426-9292

Reader service no. 716

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Acer's Ultimate Upgrade

The AcerPower starts as a 386SX, but its 486SX socket lets you upgrade to 486 power in a flash.

With the AcerPower 386SX, you can upgrade to a 486SX for the price of the chip.

STEVEN UNDERWOOD

Eric Knorr

You know it's time to trade up when you install your incredibly powerful new spreadsheet—and it feels like you're chugging uphill. Wouldn't it be great if you could just deep-six your PC's old engine and pop in a new 486?

Acer thinks so, and they've built a machine that will let you do just that. The AcerPower 386SX is your basic 20-MHz 386SX system, except that it boasts the least expensive upgrade trick yet: a socket to hold a 20-MHz 486SX. Plug in the new chip, and you more than double processing performance. The BIOS instantly senses the 486SX's presence when you boot up, puts the old CPU to sleep (and the 387SX coprocessor, if present), and transfers control to the 486SX. No jumpers to set, no expensive upgrade boards to install.

If you want 486 performance *and* math coprocessing, you need to install the full-fledged i486 (which does require moving a jumper) because there's no socket for a 487SX math coprocessor. If you do, you'll notice that the i486 offers the same 20-MHz performance as the 486SX (20 percent slower than the i486's usual minimum).

A Box With Hidden Potential

Except for its upgradable motherboard, the AcerPower 386SX bears an uncanny resemblance to Acer's 1120SX, reviewed in this issue (see "20-MHz SXs: Clones Turn Up the Heat"). It has the same compact footprint, cleanly styled chassis, and handy side-mounted keyboard and mouse ports. Both units also have room for four 16-bit expansion boards and four drives.

Surprisingly, at press time, pricing was also nearly identical. The base model 1120SX—with 2MB of RAM, built-in VGA, IDE hard drive interface, keyboard, DOS 5.0, and *Windows 3.0*—costs $1495. Acer didn't have a firm price for the AcerPower yet but predicted the same configuration would cost $1595. That may mean the AcerPower 386SX will replace the 1120SX as the company's entry-level SX desktop.

The AcerPower offers yet another upgrade perk. Add enough chips to the motherboard's video RAM sockets, and you'll have a full 1MB to play with—enough (with the right monitor) for 1024 by 768 resolution at 256 colors. For the handful of applications that let you indulge in photo-realistic color, the VGA chip will also enable you to display 32,768 colors at 640 by 480. An excellent selection of video drivers for popular applications (including *Windows 3.0* and *AutoCAD*) should ensure that you'll actually be able to use these extended graphics features.

A Stealth Upgrade

Not many of us can cost-justify a 486 for our desktop, and Acer clearly is thinking of those of us who can't. Now you can stick your hands in your pockets and say, "Oh, that little Acer 386SX will be fine for me," knowing that in some respectable period of time, you'll be able to move up to a 486SX for a pittance. (Acer doesn't sell 486SX CPUs separately, but you can buy them at an electronics supply store for about $300). Expect to see this clever scheme imitated by a slew of system makers in the near future.

Eric Knorr is the editor of PC World.

SNAPSHOT

AcerPower 386SX

Buy a 486SX chip, plug it into this upgradable 386SX's extra socket, and you'll double performance instantly.

KEY FEATURES

- **Chip-only upgrade to 20-MHz 486SX or i486**
- **VGA upgradable to 32,768 colors**
- **Small footprint with room for four drives**

AVAILABILITY

Immediate

PRICING

Tentatively $1595 for base model

Acer America
401 Charcot Ave.
San Jose, CA 95131
800/733-2237,
408/922-0333

Reader service no. 724

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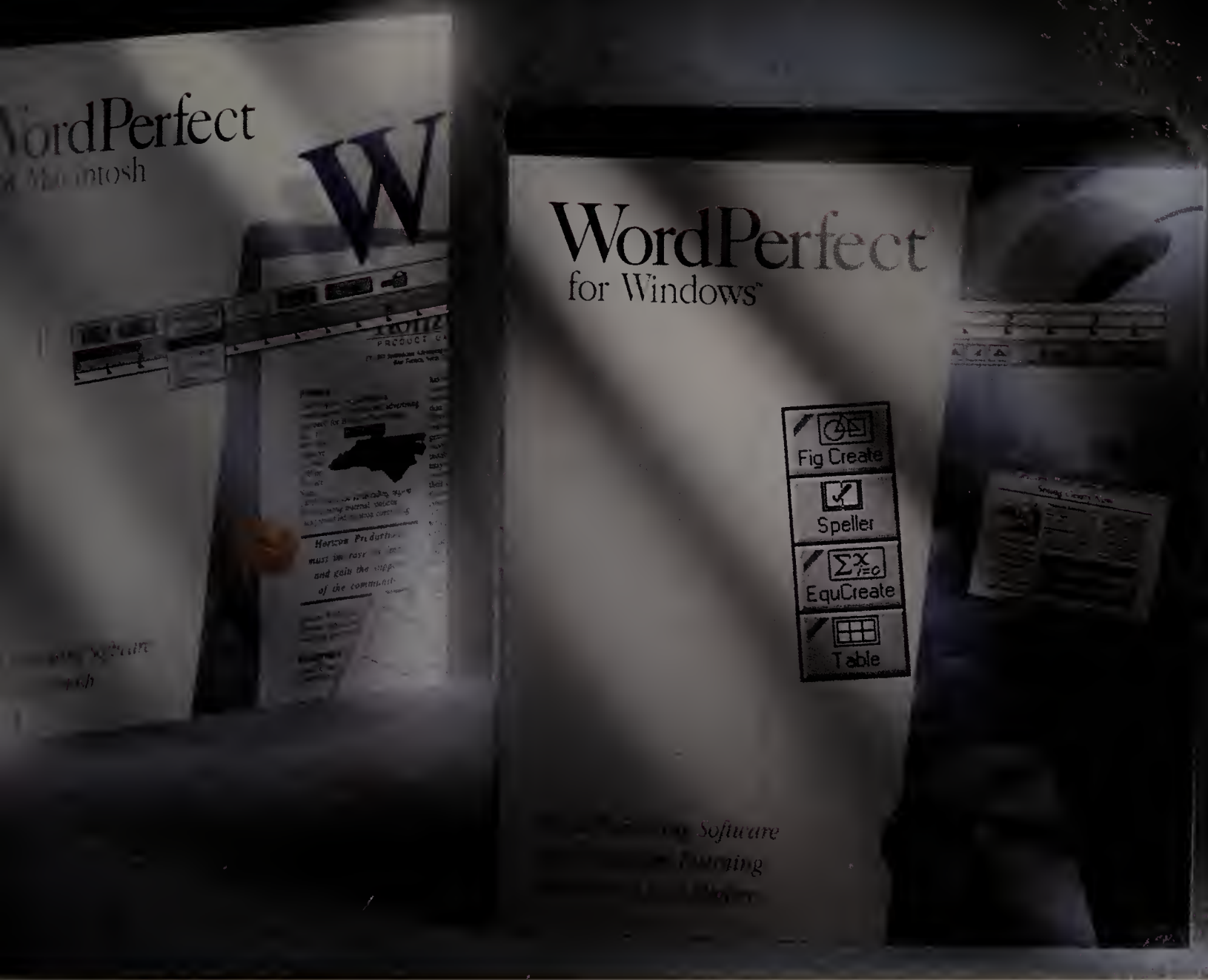

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Users of certain DOS, Windows, and Macintosh word processors can trade theirs in to get the corresponding WordPerfect product for just $150 ($179 in Canada). You can even get LetterPerfect® for just $89 ($110 in Canada) when you trade in one of the appropriate word processors. And we also have a trade-up offer for those of you on UNIX, VAX or Data General machines.

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This offer ends on March 31, 1992. So don't wait to turn your old word processor into WordPerfect. The perfect time is now.

WordPerfect
CORPORATION

NOW'S THE PERFECT TIME

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Read/write directly to database	no	yes
Intelligent field calculation features	9	74
Electronic security	no	yes
Fast mode for form filling	yes	yes
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Color support	no	yes
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On-the-fly font scaling	no	yes
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Records in Plain-Paper PostScript Color Printing

Dataproducts sets new price level for solid-ink color PostScript Level 2 printer; Seiko delivers thermal transfer PostScript color for less than $5000.

The $6995 Jolt PS from Dataproducts features 300-dpi, solid-ink color printing; Adobe PostScript Level 2; and a 200-sheet input tray. It produces high-quality color output on plain office paper.

DAN ESCOBAR

Jeff Bertolucci

While still not cheap by any stretch of the imagination, today's color PostScript printers can be termed affordable. Just three years ago, it's doubtful you would have found a color PostScript printer for under $10,000, but there's a plentiful selection today—with many more to come in the near future.

Joining the ranks of new 300-dpi color PostScript printers are Dataproducts' Jolt PS and Seiko's Personal ColorPoint PS. Each offers PostScript's excellent graphics and font features, top-notch color output, and the ability to print on plain office paper.

Solid-Ink Jolt

The Jolt PS printer from Dataproducts incorporates Adobe PostScript Level 2 and employs a solid-ink technology heretofore seen only in the Tektronix Phaser III PXi—and the Jolt PS costs $3000 less than the Tektronix.

Like the recently introduced Phaser III PXi8bi, Dataproducts' Jolt PS (and its non-PostScript sibling, the $4995 Jolt) uses its own proprietary solid-ink technology. The Dataproducts method melts solid, crayonlike, colored ink pellets and "jets" them onto the paper. The ink quickly cools and solidifies, leaving a crisp—and thoroughly dry—image.

Driven by a powerful 24-MHz Weitek 8220 RISC chip, the Jolt PS comes with 6MB of RAM, and you can add a 4MB memory board for $999.95. The Jolt PS is one of the few available printers that incorporate Adobe PostScript Level 2. This standard promises improved matching between screen color and printed output as well as support for data compression/decompression schemes that can speed up printing. However, since few—if any—software packages currently support PostScript Level 2, you'll have to wait awhile before getting your money's worth.

The Jolt PS also comes with a *Windows 3.0* driver; parallel, serial, and AppleTalk ports; a SCSI port for storing fonts on an optional external hard drive; and a 200-sheet input tray. Like other color PostScript printers, the Jolt PS is no speed demon. Its rated speed for text is only 2 pages per minute, 0.7 ppm for an entire page of graphics. Your mileage will vary with the complexity of your images.

The Jolt's solid-ink technology makes adding ink very easy. There's no liquid ink to spill on your clothes, no thermal transfer sheets to twist around your wrists. You simply lift up the hood of the printer and plug in the plastic

SNAPSHOT

Dataproducts Jolt PS

The Jolt PS uses solid-ink printing to produce crisp, 300-dpi color output an standard affice paper.

KEY FEATURES

- **Easy-to-load, solid ink pellets**
- **Adobe PostScript Level 2**
- **SCSI port for external hard drive**
- **$3000 less than Tektronix' solid-ink printer**

AVAILABILITY

Immediate

PRICING

$6995, non-PostScript model $4995

Dataproducts Corp.
6219 De Soto Ave.
Woadland Hills, CA
91367
800/289-5658,
818/888-4000 (fax)

Reader service no. 722

Priced under $5000, the Seiko Personal ColorPoint PS makes 300-dpi, PostScript color printing more affordable. It comes with 6MB of RAM, an Intel RISC processor, and 39 PostScript fonts in a laser printer-size box designed for the desktop.

GREG PRESTON

cartridges, each of which contains 23 solid-ink pellets (one cartridge each for cyan, yellow, magenta, black). Each cartridge is keyed so you won't accidentally place the magenta packet in the yellow slot.

Ink cartridges aren't cheap, however—a set of four costs $179.95. A single black cartridge runs $45 and has enough ink to print 2000 "one-page business letters." Each $60 color cartridge can print about 400 pages containing a typical business graphic, such as a pie or bar chart, Dataproducts says.

At $6995 the Jolt PS is still a bit pricey. But if you need PostScript quality and excellent color output for sales brochures or business documents, it definitely warrants your serious consideration.

Seiko's $5000 Thermal Transfer

Seiko's Personal ColorPoint PS, while using the more traditional thermal wax transfer method, also features PostScript (but not Level 2), plain paper printing, and sharp 300-dpi resolution. But what's most impressive about the printer is its price: $4999. And that doesn't mean an empty printer box that you flesh out with listed "options" either. The Personal ColorPoint PS comes standard with a 16-MHz Intel 80960 RISC processor and 6MB of RAM, as well as 39 PostScript fonts.

Seiko sees the Personal ColorPoint PS as the printer of choice for business graphics and desktop publishing. Its small size (15.9 by 17.9 by 6.3 inches) means it fits comfortably on a desk; in fact, it's smaller than many black-and-white lasers. The Personal ColorPoint PS can print on cut-sheet laser quality plain paper, the thick paper stock used for flip charts, and overhead transparencies, but for best results, Seiko recommends thermal transfer paper (it's expensive, and it can increase your color printing costs to 50 cents or more per page).

To ease printer configuration, Seiko includes a feature called input polling, which automatically seeks out and locks onto the active input port —parallel, serial, or AppleTalk. And you can use the printer's control panel to set each of the three input ports to accept commands either from PostScript or from the Hewlett-Packard Graphics Language (HP-GL) for pen plotter emulation.

The Personal ColorPoint PS comes with two interface slots, one for the PostScript controller and the other for add-in extras. If you need to store fonts on an optional external hard disk, an add-in card with a SCSI port will cost you an additional $499. Another option is the $1499 QuickCapture video interface card, which allows you to capture and print screen images without a software driver. However, the QuickCapture board forces you to print at the 72-dpi screen resolution instead of at the full 300-dpi resolution that the printer is capable of.

You can "lighten" color images produced by the Personal ColorPoint PS via the printer's control panel. This feature allows the printer to match the lighter range of colors that are produced by earlier generations of 300-dpi color printers, according to Seiko.

More Color, Lower Price

Both printers give you impressive color output at prices unheard of just a few years back. And while some business users may still balk at the prices, if you need eye-catching color graphics for business documents, sales brochures, or office presentations, the Jolt PS and Personal ColorPoint PS are worth a look.

Jeff Bertolucci is an assistant editor for PC World.

SNAPSHOT

Seiko Personal ColorPoint PS

The Personal ColorPoint PS packs color PostScript and 300-dpi quality in a $5000 printer.

KEY FEATURES

- **Small footprint to fit on your desk**
- **Speedy RISC chip for fast processing**
- **Automatically locks onto active input port**
- **Prints on plain paper**

AVAILABILITY

Immediate

PRICING

$4999

Seiko Instruments USA Inc.
1130 Ringwood Ct.
San Jose, CA 95131
408/922-5900,
408/922-5800 (fax)

Reader service no. 723

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And if that isn't impressive enough, the Dell 486P/20 comes with an upgradeable processor that can go from a 20 MHz i486SX chip all the way up to a high-end 33 MHz i486DX system, and even beyond.

Which, considering that we're talking about a computer under $2,000, is nothing short of revolutionary.

A true power user's desktop. For its low price, the Dell 486P/20 has a lot of technical innovations you wouldn't expect to find on even higher end machines. Things like programmable Flash EPROMs, for example, that make conventional methods of upgrading system BIOS seem almost obsolete. You won't have to take this computer apart and lose your patience trying to pry out a reluctant chip. Just slip in a diskette—that's all.

Expanding memory is equally convenient. One of the few PCs to support 16 MB SIMMs, the 486P/20 carries 4 memory expansion sockets, on its main board. So as your needs grow, you can keep adding RAM in 1, 4, or 16 MB increments up to a total of 64 MB. That's plenty of room to run your networking software, Microsoft Windows and just about any high-performance graphics application.

And talking about graphics, a small expansion of video memory to 1 MB (512K is standard) will put over *32,000 colors* at your disposal, letting you create images that approach photographic quality.

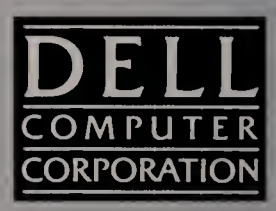
The 486P/20 also makes those images a lot easier on your eyes. It supports up to 1024 x 768 non-interlaced video at a fast 70 Hz refresh rate for a flicker-free display. Unlike the kind you get on some competitive machines that are limited to 60 Hz non-interlaced.

An i486SX processor with the future built in. Because the Dell 486P/20 upgrades via a processor chip instead of traditional processor cards, upgrading takes the form of a single, economical step:

Just remove one chip and replace it with a higher performance version.

On the other hand, if you never need to upgrade at all, you don't end up having paid a price penalty to get the system in the first place. Either way, you win.

Apart from the processor, the 486P/20 is also designed to allow easy upgrading of hard disks, memory and video capability. So when your needs change, the rest of your computer can, too.



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THE DELL 486P/20 20 MHz i486SX SYSTEM.*

SYSTEM INCLUDES 50 MB HARD DRIVE, VGA COLOR MONITOR, AND 2 MB RAM.

THE MORE YOU GET, THE MORE YOU SAVE.

If your requirements call for a more powerful or specialized system than the one we've just mentioned, here's an amazing fact: feature for feature, you can get an even better deal with our higher-end i486 systems. From $248 all the way up to a whopping $1,348, your savings increase with the sophistication of the Dell System* you buy. So go ahead, read on. And if you still have any doubts, call us. We'll be happy to explain how the more our i486 systems cost, the less they actually cost.

MORE VALUE

The Dell 486P/20 is a 20 MHz i486SX general purpose workstation you can upgrade to 33 MHz and beyond.

For a configuration that costs so little, you sure get a lot.

Like programmable Flash EPROMs for easy BIOS upgradeability.

And an 80 MB hard disk drive with 15 ms access time.

And an 8 KB cache built into the processor for increased throughput.

And 4 MB of RAM on 32-bit SIMMs with gold-plated connectors for greater reliability.

And 2 floppy drives.

Surprised? Keep reading.

You'll also get a 1024 x 768 14" color monitor with long persistence phosphors.

And the power to display 32,000 colors simultaneously, if you expand video memory to 1 MB.

And factory-installed MS-DOS® 5.0 and Microsoft Windows 3.0.

And a Microsoft Mouse.

And, considering it's from Dell, a whole lot of peace of mind.

That, by itself, is worth a fortune.

THE DELL 486P/20 20 MHz i486SX SYSTEM.*

SYSTEM INCLUDES 80 MB HARD DRIVE, SUPER VGA (1024 x 768) COLOR MONITOR, 5.25"1.2 MB AND 3.5"1.44 MB FLOPPY DRIVES AND 4 MB RAM.

SAVE $248▽

MORE PRODUCTIVITY

The Dell 486D/25 is a sophisticated productivity workstation that was designed with your future in mind. To upgrade from a 25 MHz i486SX processor to a faster processor when available, all you'll need to do is replace a processor chip. Not a card. And starting with 4 MB, you can keep adding RAM up to a maximum of 64 MB.

This new system is priced on par with 33 MHz i386DX machines, yet performs up to 40% faster. And its sheer processing power is amply backed by a 100 MB hard drive with a 32 KB cache for increased throughput. A dual floppy drive completes the excellent storage arrangement.

A 1024 x 768 14" color monitor with a 70 Hz refresh rate gives you a flicker-free display. With 32,000 colors, if you make a small expansion of video RAM. Should anything go wrong, the built-in SmartVu™ diagnostic display can find the problem, even if the monitor goes down.

The 486D/25 comes with six expansion slots and five drive bays for added flexibility. You'll also get factory-loaded MS-DOS 5.0, Microsoft Windows 3.0 and a Microsoft Mouse.

THE DELL 486D/25 25 MHz i486SX SYSTEM.*

SYSTEM INCLUDES 100 MB HARD DRIVE, ULTRASCAN™ 14C MONITOR, 5.25"1.2 MB AND 3.5"1.44 MB FLOPPY DRIVES AND 4 MB RAM.

SAVE $748▽

MORE SPEED

From desktop publishing to spreadsheet applications, there's one feature that's always welcome, and that's speed. With quick recalcs and lightning fast screen refreshes, you'll get your work done faster with the Dell 486P/33.

The 33MHz i486DX processor generates up to 80% more performance than 33MHz i386DX systems. If that leaves you craving for more, you can upgrade to a faster i486 processor when available.

This 486P/33 configuration features a 100 MB hard drive with a phenomenal 15 ms average access time. An 8 KB cache in the processor boosts performance. And dual floppy drives allow you to read any diskette, regardless of MS-DOS format.

A 1024 x 768 non-interlaced big 15" color monitor with overscan gives you 30% more viewable area than the standard 14" you get with any competitively priced system. For even more versatility on desktop publishing or graphic-intensive applications, just expand video RAM to 1 MB and you'll get a 32,000 color, near-photograph quality display.

The system comes with 4 MB RAM on 32-bit SIMMs with gold-plated connectors. MS-DOS 5.0, Microsoft Windows 3.0 and a Microsoft Mouse.

THE DELL 486P/33 33 MHz i486DX SYSTEM.*

SYSTEM INCLUDES 100 MB HARD DRIVE, ULTRASCAN 15C MONITOR, 5.25"1.2 MB AND 3.5"1.44 MB FLOPPY DRIVES AND 4 MB RAM.

SAVE $948▽

MORE GRAPHICS

The Dell 486D/33 has every high-end feature you'd expect in an outstanding graphics workstation. Except a high-end price tag.

There's a superfast 33 MHz i486DX processor, with 8 KB internal cache. For even greater performance, all you'll need to do is replace a processor chip. So you can upgrade inexpensively as soon as new chips hit the market.

Should your workload, heaven forbid, triple by then, you'll still find the 200 MB hard disk more than adequate.

And as your requirements become increasingly more sophisticated, you can keep adding to the 486D/33's 8 MB RAM. With a maximum of 64 MB, there's plenty of room to grow.

Talking about room, we have a large 15" flat square monitor with 30% more viewable area than a standard 14" monitor, which makes those large spreadsheets and high resolution documents much easier to read.

The Dell 486D/33 comes with factory-loaded MS-DOS 5.0, Microsoft Windows 3.0 and a Microsoft Mouse.

intel inside

THE DELL 486D/33 33 MHz i486DX SYSTEM.*

SYSTEM INCLUDES 200 MB HARD DRIVE, ULTRASCAN (1024 x 768) 15C MONITOR, 5.25"1.2 MB and 3.5"1.44 MB FLOPPY DRIVES AND 8 MB RAM.

SAVE $1,348▽

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Gold-plated SIMMs increase system reliability by eliminating connection-related errors.

There are plenty of companies anxious to sell i486 systems at a low price. All they really need is a supply of parts (the cheaper, the better) and a garage to assemble them in. Once the "production line" gets going, they place a few ads in the paper. After that, of course, it's anyone's guess as to which will last longer: the computer or the "company" it came from.

The 486P/20 is one of the few computers to feature 16 MB SIMMs.

At Dell, on the other hand, we offer lower prices by cutting down on traditional retailer mark-ups, not quality. In fact, we're almost fanatical about the quality of every machine that leaves our state-of-the-art factory. That attitude is reflected in the way we design, test, manufacture and ship our i486 systems.

To see how our i486 systems stand up to air delivery, we use a Black Box. Or, in technical parlance, a portable accelerometer/thermometer. This little device is fitted into a test computer which we then send out through regular delivery channels, much as if you had ordered it yourself. When we bring it back, the "Black Box" tells us exactly what the computer went through, in terms of shock, vibration and temperature. This innovative test is part of a series that's been so successful in helping us improve our packaging, we've won an international award for package design.

Our Black Box test makes sure your Dell computer never arrives this way.

To make our computers more reliable, we cook them. After our computers are fully assembled and configured, randomly selected units are "burned-in" and tested at 104°F.

In perhaps the most grueling temperature test we've ever come up with, pilot Dell systems must survive a storage chamber where temperatures vary rapidly between −40°C and +60°C.

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And if you think that's rough, consider our shock test. Sample i486 computers are strapped to a guillotine-like apparatus which repeatedly drops them to the ground. This tells us what we can do to improve their shock tolerance level.

Our power supply units undergo an equally rigorous quality control process. In a test that simulates several years of actual usage, randomly selected test units are switched on and off *1,200 times;* only then can they be approved.

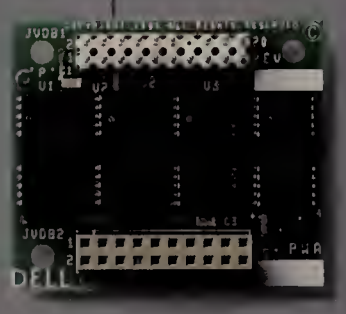
While our testing may seem a little extreme, it's based on a rather simple fact: if our machines don't fail with us, they haven't much chance of failing with you, either.

Our computers have a heart of gold. At Dell, we take quality consciousness so seriously, we fit our i486 systems with SIMMs that have gold-plated connectors. If you're wondering what such expensive components are doing in relatively inexpensive computers, the answer is simple: they cost us a bit more, but by eliminating connection-related errors, they're worth their weight in gold.

Random Dell computers are "burnt in" at 104 degrees Fahrenheit.

It's exactly this kind of commitment to quality control that's enabled us to meet CSA, UL, TUV-GS, FCC and VDE standards, earning worldwide regulatory approvals.

There are thousands of ways to use a Dell i486 system. Dell i486 systems are tested for compatibility with major peripherals, software applications, network topologies and network operating systems, including Banyan and Novell, in several hundred permutations per system. They're even tested for AS-400 connectivity. So you can use our machines in virtually any environment.



A small expansion of video memory gives you over 32,000 colors for a near photographic quality display.

50% fewer opportunities for things to go wrong. After the traditional computer manufacturer builds a system, it goes to the dealer, who then does his own configuring. That's 2 stages of manufacturing, which means twice as many opportunities for things to go wrong.

A Dell i486 system, on the other hand, is manufactured only once. We custom-configure memory boards, network cards and advanced video, testing the system as a unit.

We even load select software packages you buy from us, at no cost to you. That includes MS-DOS 5.0, Microsoft Windows 3.0, and many popular applications programs.

With 20 diskettes and 2 hours to load and configure just one system, imagine the time you'll save and the potential hassles you'll avoid. Which gives you yet another reason to buy a Dell i486 system:

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As a potential buyer, you'll receive lots of attention from most computer companies. Until they receive your check, that is. For all practical purposes, once the sale is closed, so is the company.

At Dell, on the other hand, half our story begins after you receive your computer. Despite our low prices, we've built a reputation for the highest level of support in the industry.

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In the unlikely event that you have a problem with your computer, it won't last long. Our technical support staff solves 90% of reported problems over the phone. Usually in six minutes or less.

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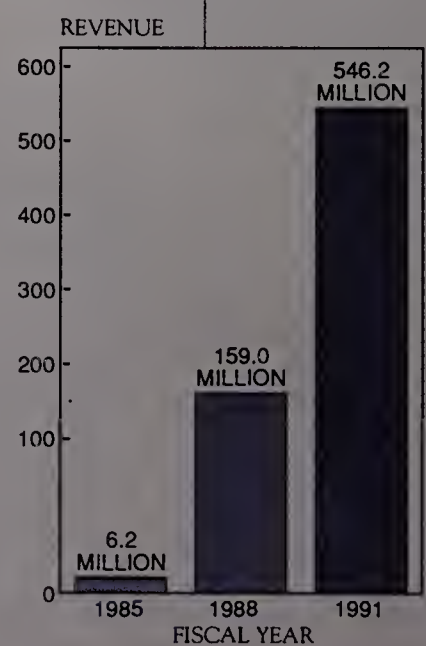
We even have a special section on CompuServe's PC vendor forum. So you can view other users' problems, and, more importantly, our solutions. But what makes our bulletin board special is that we constantly monitor what goes on there. Which means we can keep track of any small problems, and stop them before they become big ones.



Dell has built a $546 million dollar business by building a relationship with every customer.

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On-site service is an ambiguous term.

To some enterprising vendors, it conveniently means that the replacement parts, and not the service technician, will arrive on-site. Which isn't as crazy as you may imagine; there are any number of do-it-yourself computer whiz kids in this business.

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ranks, you'll prefer Dell's way of supporting our machines.

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Buy a computer and get the company.

By standing firmly behind every machine we've ever sold, we've built up a $546 million company in just seven years, one customer at a time.

On the way, we've acquired quite a following. For example, the editors at *PC Week* have described the Dell service and support package as "overkill." J.D. Power and Associates® ranked Dell "Best PC in Customer Satisfaction in Small to Medium Sized Businesses."

We've won *PC Week's* Customer Satisfaction Poll an unprecedented eight times.

And in the last 12 months alone, we've collected 53 product awards, including *PC Magazine's* Editor's Choice, *InfoWorld's* Buyer's Insurance and *PC World's* Best Buy and World Class Awards.

Last year, Dell won customer satisfaction polls in the U.S., U.K., Germany and France.

And it's not just the smaller users that are satisfied, either: Dell computers are now used by over two-thirds of the FORTUNE 500.* Overseas, it's been pretty much the same story. We've more than doubled our overseas sales in the last 3 years in a row, and won in customer satisfaction surveys in the UK, Germany and France.

Still can't decide? Take 30 days to make up your mind. Within that time, if you aren't completely satisfied, just return your Dell system and we'll refund your money, no questions asked.

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What does keep coming back, in ever increasing numbers, are our customers. Over 70% of the people who buy a Dell computer buy another. That's perhaps the strongest statement of satisfaction any manufacturer could ever hope to receive.

So before you buy an i486 system, ask around; there are plenty of Dell users out there. And if there's anything you need, call us. But you'd better hurry.

Our 53 product awards in 1991 alone make Dell one of the most awarded PC companies in the world.

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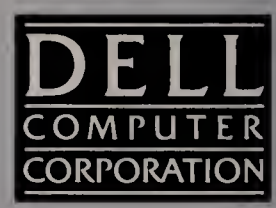

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PRODUCT OUTLOOK

Edited by RUSSELL GLITMAN

Toshiba T4400SX

First 25-MHz 486SX Laptop Offers Power on the Road

The new Toshiba T4400SX, available with an LCD display (left) or gas plasma display (right), features a 25-MHz 486SX processor and a rugged carbon-fiber reinforced plastic case.

If you need power on the road, you'll appreciate the Toshiba T4400SX. The T4400SX, the first notebook built around Intel's new 25-MHz 486SX chip, boasts an array of slick features sure to please portable-power fanatics. This is one of the first systems of any kind built around the 25-MHz 486SX, which is simply a regular 25-MHz 486DX with the math coprocessor disabled. If you don't run software that benefits from floating-point math (mostly spreadsheets, CAD, and page design packages), you'll get 25-MHz 486DX performance.

With a CPU this hot, it's amazing that this 7½-pound unit is battery powered. Toshiba estimates a battery life of 3 hours under normal use. The unit's size puts it squarely in the notebook category: 11.7 by 8.3 by 2.2 inches. It comes standard with 2MB of RAM, a 60MB hard disk, and a 32-level gray-scale VGA LCD screen. You can add up to a total of 10MB of RAM by plugging in one of Toshiba's neat credit card–style upgrades, and you can also choose an 80MB hard disk option. The case is made of carbon-fiber reinforced plastic, which should help the T4400SX stand up to the more prosaic rigors of the road.

More exciting is the low-power gas plasma VGA option. Toshiba says the T4400SX is the smallest laptop available in the United States that uses this alternative to LCD.

An auto-resume feature saves your work when the computer is turned off or the battery runs down.

The system costs $5299 with a 60MB hard drive and an LCD screen; add $300 for an 80MB hard drive and $300 for the gas plasma screen.

—*Robert Lauriston*

IN BRIEF

Toshiba T4400SX
The T4400SX puts the power of a 486SX desktop into a notebook package.
Toshiba America Information Systems
P.O. Box 19724
Irvine, CA 92713-9724
800/457-7777,
714/583-3000
Reader service no. 664

INSIDE PRODUCT OUTLOOK

114 **Fahrenheit 1280** Low-cost super-VGA card draws *Windows* screens 25 times faster.

118 **DR DOS 6.0** Digital Research upgrade tops MS-DOS at task switching, disk performance, and RAM access.

122 **FotoMan** A digital camera stores pictures on your PC.

124 **AST Advantage Line** Four plug-and-play PCs with high performance and low prices.

126 **ExpressWriter 201** A lightweight portable printer gives you laserlike output on the road.

128 **TravelMate 3000 WinSX** Texas Instruments' notebook is designed to run *Windows* smoothly on batteries.

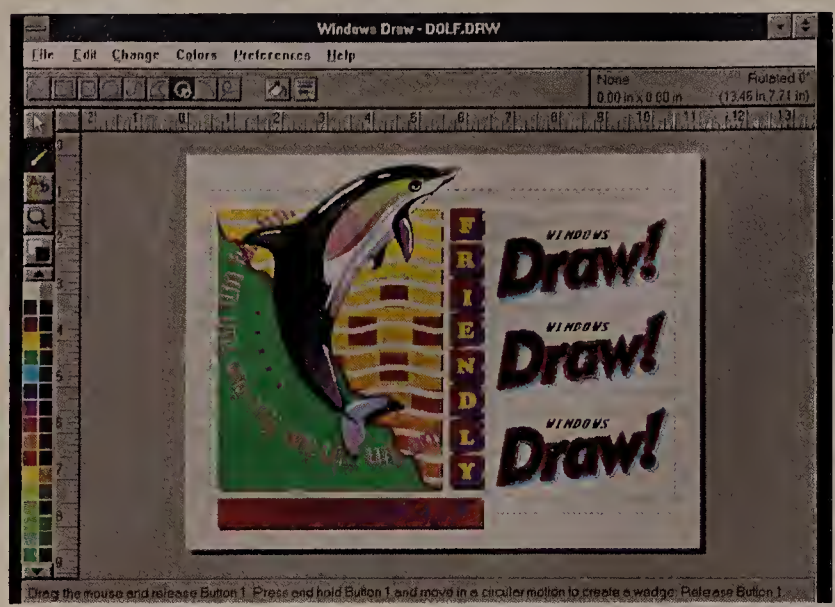
129 **IBM LaserPrinter 4029 Series** Versatile lasers from IBM spin-off combine a wide range of upgrade options, no-nonsense pricing.

130 **BusinessStation 486ASX, PowerPro Array** ALR's EISA 486SX workstation and twin-processor file server are high-tech under the hood.

131 **ReadStation** Standalone scanner reads documents onto a floppy with the push of a button.

Micrografx Windows Draw

Drawing Ahead of the Competition with Simplicity and Price



A simple interface and ease of use make Windows Draw an ideal package for the nonprofessional artist.

If you'd wanted to be an artist, you'd have grown a goatee and gone to art school. But when you need that artistic touch—say, a customized logo or a simple graphic for a slide presentation—an expensive and complicated illustration package can be overwhelming. That's where Micrografx's *Windows Draw* enters the picture.

At $149.95, *Windows Draw* costs less than one-third the price of *Corel Draw* or *Micrografx Designer* and sports a much simpler interface. Instead of selecting from a single complex toolbox, you click on one of three icons—for drawing, text, or editing. The essential tools for each of these modes are displayed across the top of the drawing area. More advanced features are available via dropdown menus.

When you select a tool, a "hint line" along the bottom of the screen tells you what the tool is and how to use it. A handy status box in the upper right corner tells you which mode you're in, the cursor's position, and the size of the page you've selected.

Windows Draw comes with all the essentials for creating lines, boxes, and circles, plus tools for creating Bézier curves and blending objects. However, professional illustrators will still need *Designer* or *Corel Draw* for sophisticated features such as multiple layers, dimensioning, or the ability to create color separations.

If you'd rather modify an existing image, you can choose from *Windows' Draw*'s 2600 pieces of clip art in its native DRW format. You can search the clip-art library by name, or preview images before placing them on the page.

Draw lets you add text directly to an image, bend it along a curve, or manipulate individual characters to create custom headlines and logos. You get 13 Bitstream Speedo scalable fonts, and you can use additional Adobe Type 1 fonts via *Adobe Type Manager*. Handy *Excel 3.0*–like buttons let you quickly select fonts and assign attributes such as bold and italic.

Draw supports all major file formats, including EPS, CGM, and Macintosh PICT. You can even display, crop, and print 24-bit PCX and TIFF images, but *Draw* offers no way to trace them.

Windows Draw requires a tidy 1.5MB of disk space, plus an additional 5.5MB for clip art. While *Draw* will run on a 286, Micrografx recommends a 386 with at least 2MB of RAM. —*Daniel Tynan*

IN BRIEF

Micrografx Windows Draw

WINDOWS A passel of drawing features in an easy-to-use $150 package.

Micrografx, Inc.
1303 Arapaho
Richardson, TX 75081
800/733-3729,
214/234-1769
Reader service no. 678

Fahrenheit 1280

Orchid Sets Windows on Fire

Drawing new screens in *Windows* can be as much fun as watching molasses pour. One way to accelerate *Windows* is to get the Fahrenheit 1280 from Orchid, a low-cost super-VGA board that Orchid claims can draw *Windows* screens up to 25 times faster than standard super-VGA cards do.

The secret of the Fahrenheit's speed is built-in hardware that interprets and executes *Windows* operations such as moving blocks of pixels that occur when you move text or graphics. The Fahrenheit should also speed up line drawings, which are commonly used in CAD packages.

However, the Fahrenheit creates no speed gain with DOS applications; a few DOS programs, mostly games, actually exhibit a slight speed loss. On the other hand, the Fahrenheit does comply with VESA specifications for super-VGA compatibility.

The Fahrenheit includes up to 1024 by 768 noninterlaced resolution in 16 or 256 colors, plus eye-saving 70- and 72-Hz screen refresh rates. Moreover, the board will run all your existing monochrome, CGA, EGA, and VGA DOS software at the fast, flicker-free refresh rates.

You'll need a multiscan monitor like NEC's MultiSync 4FG for maximum performance, but for any serious *Windows* user, the monitor's purchase price is money well spent. If you have only a regular VGA monitor, that's okay too: Screen speed and colors aren't compromised; you just won't get the quicker, eye-saving refresh rates or higher resolutions until you upgrade.

The Fahrenheit 1280 is backed by a four-year warranty and toll-free tech support and retails for $449 (70 Hz with 512K of RAM and 16 colors) and $499 (72 Hz with 1MB of RAM and 256 colors).

—*TJ Byers*

IN BRIEF

Fahrenheit 1280
This video card speeds up *Windows* screen operations by as much as 25 times while providing flicker-free super-VGA viewing.

Orchid Technology
45365 Northport Loop W
Fremont, CA 94538
800/767-2443,
510/490-9312 (fax)
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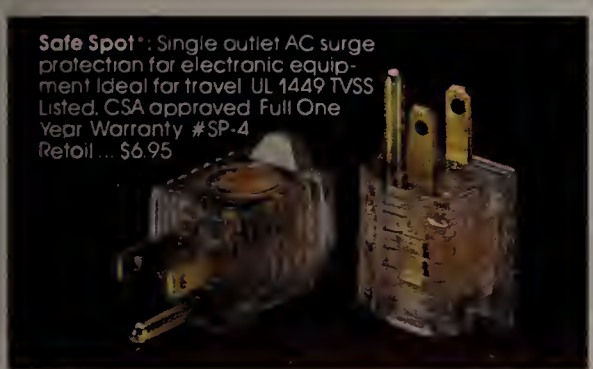

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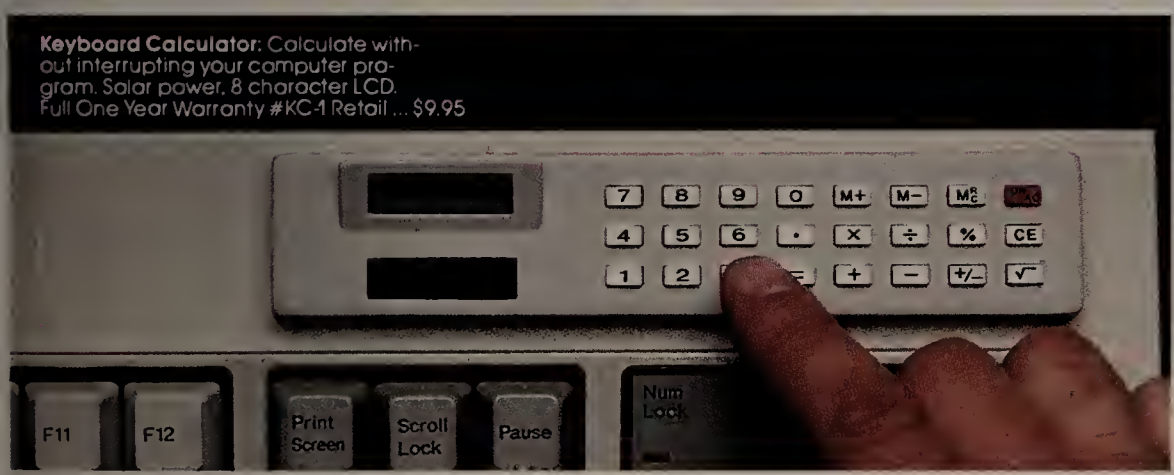
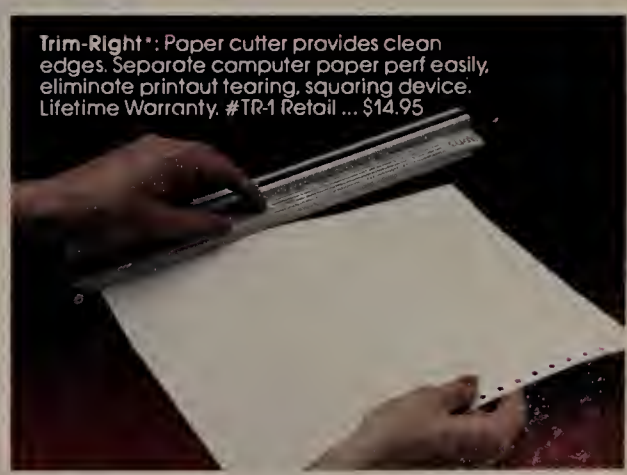


Keyboard Calculator: Calculate without interrupting your computer program. Solar power. 8 character LCD. Full One Year Warranty #KC-1 Retail ... $9.95



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Way You Work

A New Way to Organize Your Tasks

Proteo's *Way You Work* combines features you might expect in a PIM, a groupware application, a DOS shell, a macro generator, a document manager, and a network E-mail utility.

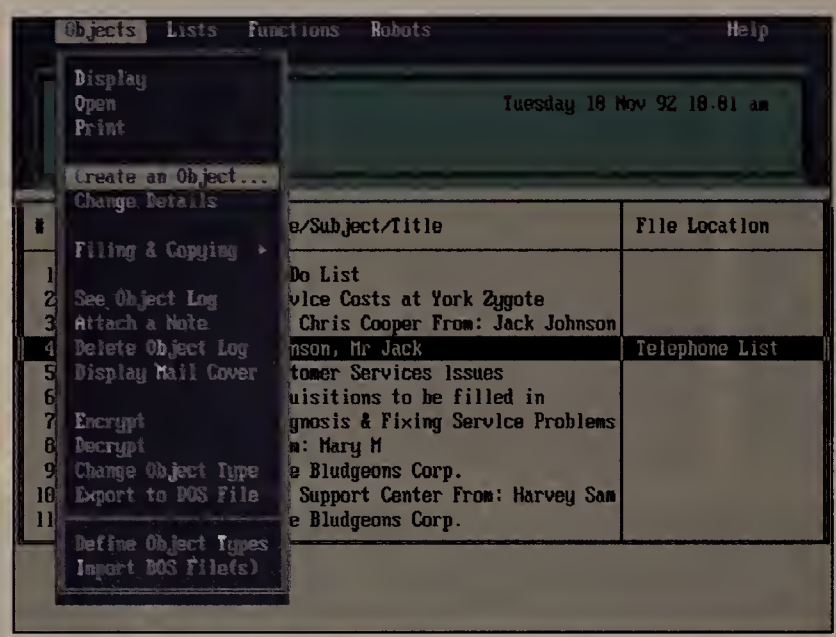
Way You Work starts with a built-in object-oriented data base that organizes information of all kinds, including customer contacts, appointments, and phone numbers (with a built-in auto-dialer). Then *Way You Work* allows you to integrate applications such as *1-2-3* and *WordPerfect* and their documents seamlessly into its environment. Click on a document, and *Way You Work* takes care of finding the appropriate application, runs it, and loads the file.

As in Hewlett-Packard's *NewWave* and the Macintosh Finder, *Way You Work* users can tag documents with long, explicit names rather than cryptic DOS names. But *Way You Work*'s filing system has more powerful features, too.

The system benefits from scripts called "software robots" that track down files associated with unfinished tasks, place them on your desktop, and discard wastebasket items more than a certain number of days old.

Way You Work's file organizing and automatic document processing capabilities work under *Windows* as well as DOS. While *Way You Work* runs as a full-screen DOS app or in a text window, it launches *Windows* applications and organizes the documents they use, providing an ergonomic replacement for *Windows'* Program Manager and File Manager, which can still run beside it.

Way You Work comes in three parts. The Personal Office package includes the basic data base, PIM, E-mail, and document processing functions. The Workgroup Module lets you automatically manage document flow throughout an organization, share calendars and documents across a LAN, and back up work to a network server. Finally, the Toolkit Module allows you to customize the environment and link users to mainframe applications. With *Way You Work*, you have the tool to manage your desktop. —*Brett Glass*



Way You Work is a DOS shell that includes an object-oriented data base designed to help managers keep track of contacts and applications.

IN BRIEF

Way You Work
This file manager promises to keep track of documents and applications, as well as phone numbers and contacts.
Proteo Technology Corp.
210 Carnegie Centre
#101
Princeton, NJ
08540-6233
800/668-6716,
416/479-2000
Reader service no. 680

JetWay

Work-Group Printing Without a LAN

If all you want to do is connect a printer to a group of PCs, you don't need a network, thanks to ASP Computer Products' JetWay.

The memo pad–size JetWay printer-sharing device works with any standard parallel printer/PC combination. It's available in four- and eight-user configurations. Company officials claim it provides simultaneous access to a printer at up to 115 kbps.

The JetWay builds on ASP's ServerJet product, an internal sharing device that connects a variety of HP LaserJet printers. Installation is relatively simple. You can mount the unit on a wall or attach it to the side of your printer to save space. ASP supplies modular RJ-11 telephone-type cables and RJ-11 converters that come in 9-pin and 25-pin models.

To hook the JetWay to each PC, attach a converter to a PC's parallel port. Plug one end of the RJ-11 wire into the converter, and the other into the JetWay unit. Then connect the printer's parallel port cable to the JetWay.

ASP officials claim the JetWay's default software will have you and your DOS work group up and printing in moments. But you can tailor the JetWay, too. It comes with software that lets you customize it to your printing environment so Macs and UNIX minicomputers can share the same printer with your PC. And each port can be configured separately.

The JetWay comes with 2000 feet of RJ-11 cable, but at that distance you can expect transmission speeds of 9600 baud. If the PC is within 200 feet of the printer, you get the speedy 115,200-baud rate.

Depending on your workgroup size and printing tasks, the JetWay's 256K buffer may be a little less than you need. No problem: ASP offers upgrades in 1MB increments up to 4MB. The four-port JetWay retails for $345, the eight-port model for $545.

—*Russell Glitman*

IN BRIEF

JetWay
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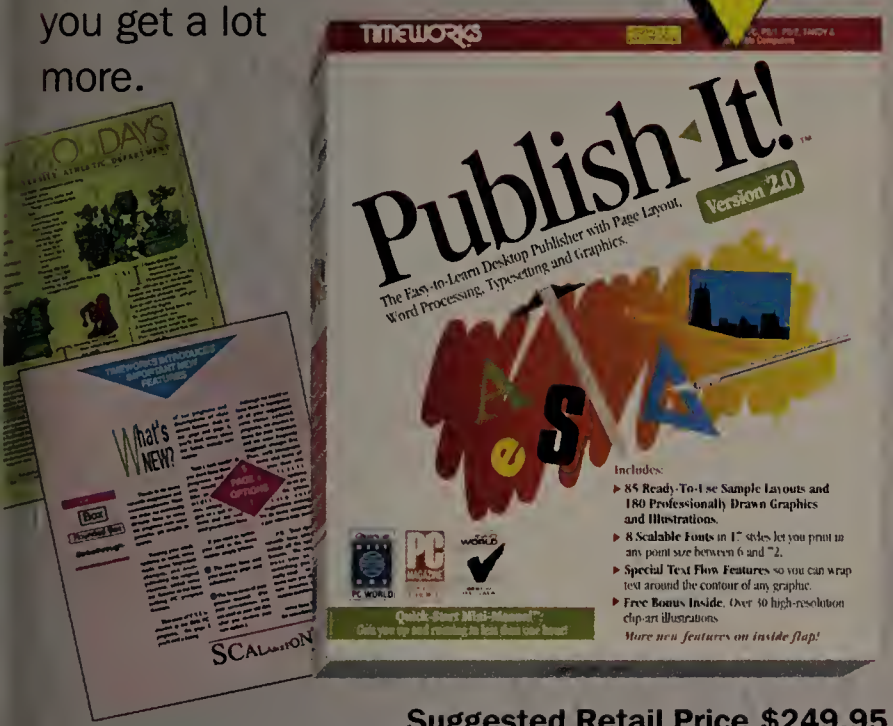

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Signature _____

DR DOS 6.0

Staying a Few Steps Ahead of MS-DOS

Digital Research is again trying to set the standard for DOS with version 6.0 of DR DOS, but this time the tiny Monterey, California, firm has two big allies in its efforts—IBM and Novell. Version 6.0 tops Microsoft's version 5.0 of MS-DOS with better disk performance, faster task switching, access to more RAM, and improved security, while providing full *Windows* support.

IBM's schism with Microsoft and DRI's acquisition by Novell—which has a comarketing agreement with IBM—could position DR DOS as the client operating system of choice on networks and in Big Blue shops.

DR DOS 6.0's 386 memory manager, EMM386, works better than ever with *Windows*, running it not only in 386-enhanced mode but also in standard mode. In informal testing, we ran several demanding *Windows* applications at the same time and during the process uncovered no *Windows* incompatibilities.

Version 6.0 lists for $99 and comes chock-full of features that are either unavailable in MS-DOS 5.0 or are more extensive than Microsoft's offering. Among them:

- DiskMax: disk optimization software that has a built-in file defragmenter, an optional compression feature that will almost double the amount of available space on your hard disk, and a cache that DRI claims is faster than the one in MS-DOS 5.0. DiskMax also boasts an enhanced undelete function that lets you recover erased files even after extensive disk use. And new password security features let you lock your keyboard and protect files, subdirectories, and entire disk partitions from prying eyes.
- TaskMax: a task switcher that handles 20 programs at once. Like MS-DOS 5.0, TaskMax doesn't require a graphical shell. Unlike MS-DOS 5.0, which only swaps to disk, it also keeps multiple applications in RAM.
- MemoryMax: a memory manager, improved from earlier versions, that gives you up to 628K of RAM. Unlike MS-DOS 5.0, MemoryMax lets you load TSRs in high memory on most 286 systems.
- FileLink: a PC-to-PC serial file transfer program lets you move data between desktop and portable.

Other nice touches abound. For instance, a special command in CONFIG.SYS lets you change your system's configuration interactively at boot time. DR DOS 6.0 also comes with a text editor, a graphical shell, and on-line documentation and help.

Unlike the retail MS-DOS 5.0, DR DOS 6.0 isn't an upgrade; it's a complete copy of the operating system that can be installed on any machine.

—Brett Glass

DR DOS 6.0 features a task switcher, TaskMax, that can shuttle between 20 programs and keeps applications in RAM for speedy access.

IN BRIEF

DR DOS 6.0
The latest version of Digital Research's DOS-compatible operating system offers many new features and utilities.
Digital Research, Inc.
70 Garden Ct.
Box DRI
Monterey, CA 93942
800/274-4374,
408/649-3896
Reader service no. 669

External Ethernet Adapter, External Token Ring Adapter, Pocket Ethernet Adapter II

Xircom's Three Musketeers Adapt to Any Network

Xircom's parallel port network adapters offer a simple alternative to the floppy disk shuffle when you move data from laptop to LAN.

The External Ethernet and External Token Ring adapters, aimed for installation on your desktop, are quite similar. The adapter itself is a small box, about 6 inches square and 2 inches high, with a 20-inch cable that leads to your laptop's parallel port. The Ethernet model can hook to standard thin cable, 10Base-T twisted pair, or AUI (for thicknet external transceivers); the Token Ring has connectors for 9-pin Type 1 or RJ-45 Type 3 media. In both cases, the adapter automatically senses which cable is connected and adjusts itself accordingly.

For those who need to make network connections while on the road, the Pocket Ethernet Adapter II provides a lighter, cheaper, and faster solution than its predecessor did. The 3-ounce gadget measures just 4 inches long and isn't much bigger around than a standard parallel plug. Three different models are available to match the three popular cable types.

All the adapters include diagnostic readout lights and preconfigured drivers for all popular network operating systems.

The External Ethernet Adapter costs $595, the External Token Ring Adapter $945, and the Pocket Ethernet II $495 for thin coax or AUI or $545 for 10Base-T.

—Robert Lauriston

IN BRIEF

External Ethernet Adapter, External Token Ring Adapter, Pocket Ethernet Adapter II
Xircom's adapters move data between laptop and network.
Xircom, Inc.
26025 Mureau Rd.
Calabasas, CA 91302
800/874-7875,
818/878-7600
Reader service no. 675

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TEXAS INSTRUMENTS

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Circle 263 on reader service card

QMS-PS 815MR, QMS-PS 825MR

You Have a Choice With 600-dpi Multiresolution Solution

If industry-standard, 300-dot-per-inch, laser-quality output isn't quite sharp enough for the graphics and text you're working with these days, you might consider upgrading to one of the 600-dpi lasers hitting the market. If you need *both* 300- and 600-dpi resolution, QMS thinks it has the answer with its new 815MR and 825MR laser printers.

The *MR* stands for *multiresolution.* Both printers use the 8-page-per-minute Canon SX/TX engine, but don't expect 8-ppm performance when printing at 600 dpi. (In fact, QMS says it takes 25 to 30 percent longer to print at 600 dpi than it does at 300 dpi.) QMS PostScript printers allow you to switch between 300 and 600 dpi by using the printer's control panel or via software commands. QMS also sells "non-MR" versions of the 815 and 825 that offer 300-dpi resolution only.

Certainly not everyone needs to switch between 300 and 600 dpi, but switchable resolutions can come in handy if you're using the same printer both to proof output and to produce near-typeset–quality graphics and text. The speed comes from 300 dpi; 600 dpi provides the muscle and eliminates the jaggies.

The only difference between the 815 MR and 825 MR is that the latter costs $1000 more and comes with a second 200-sheet letter-size input tray. As a result, the 825MR is also slightly taller than the 815MR (roughly 12 inches tall instead of 9). Both machines have an 18-by-25-inch footprint. Legal, large-capacity letter, A4, and envelope input trays are available for both printers.

Priced at $5995 and $6995, respectively, the 815MR and 825MR come with a 20-MHz 68020 processor and 6MB of RAM. You can add an additional 6MB of RAM for $995 (the extra RAM can speed 600-dpi printing). The printers feature QMS's emulation sensing, automatically selects PostScript or Hewlett-Packard's PCL 4 printer language. However, there's no PCL 5 support. If you desire HP-GL 7475 plotter emulation, you'll have to buy a $295 add-in card that plugs into one of the printer's two card slots.

The printers' three interfaces—serial, parallel, and LocalTalk—can all be active at the same time. This means you won't have to change your interface selection by flipping a switch on the printer or by issuing a software command. Both the 815MR and 825MR come with 45 Adobe typefaces and PostScript printer drivers for *Windows 3.0* and other popular software.

The standard 815 and 825 models, which print at 300 dpi only, sell for $3995 and $4695, respectively. —*Jeff Bertolucci*

Featuring PostScript output and an 8-ppm Canon engine, the QMS 815MR and 825MR printers let you switch between 300- and 600-dpi resolution.

IN BRIEF

QMS-PS 815MR, QMS-PS 825MR
Two PostScript printers offer user-switchable 300/600-dpi resolution.
QMS, Inc.
One Magnum Pass
Mobile, AL 36618
800/523-2696,
205/633-4300
Reader service no. 728

NetWare Lite

All PCs Serve in Peer-to-Peer NetWare

After years of insisting that even the smallest LAN needs a central server, Novell has finally come out with a peer-to-peer network operating system that lets any station on a LAN share its files with any other.

With NetWare Lite's peer-to-peer sharing, you can store shared files on whatever computer makes the most sense—probably the one that uses them most often. You can also share files on the fly or transfer them from one PC to another.

Like regular NetWare, Lite's memory requirements are small—just 50K per workstation, or 25K if you don't share your workstation's resources with the network. Novell promises full compatibility with the thousands of NetWare-compatible applications already in use. Of course, if you've got a sensitive shared data base that demands maximum security and optimum performance, you want to put it on a dedicated file server. No problem. NetWare Lite can coexist with NetWare 2.*x* or 3.*x* servers, so you can have file server security and peer-to-peer convenience on the same network.

To make NetWare Lite even more appealing, Novell is bundling it with DR DOS 6.0 (see "Staying a Few Steps Ahead of MS-DOS," also in *Product Outlook*). This is an attractive one-pass setup for new workstations—$99 gets you an OS and an NOS. All you have to add is a network board.

NetWare Lite supports a score of popular network boards from Novell, IBM, Western Digital, SMC, 3Com, and Artisoft.

Cost is $99 per workstation, and you can have as many as 25 workstations on a Lite LAN. Phone support—via a 900 number—costs $20 per incident. NetWare Lite comes on a single floppy and installs in just minutes, according to a representative from Novell.

—*Robert Lauriston*

IN BRIEF

NetWare Lite
Any PC can be a server with Novell's peer-to-peer NetWare Lite.
Novell Inc.
Novell Product Information
122 East 1700 South
Provo, UT 84606-6194
800/638-9273,
800/526-5463
Reader service no. 676

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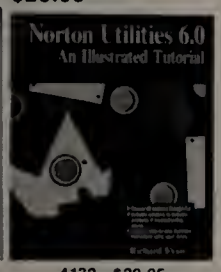

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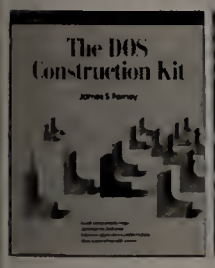

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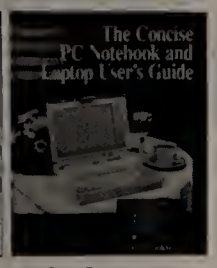

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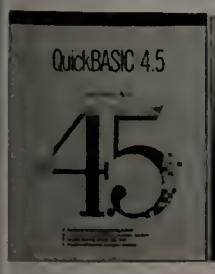

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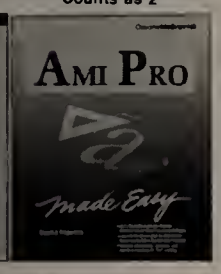

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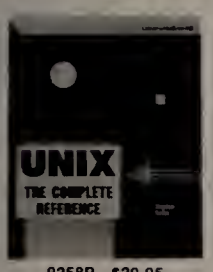

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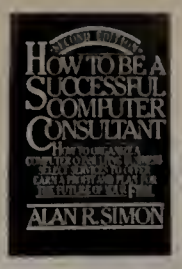

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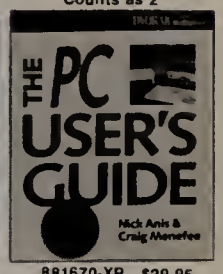

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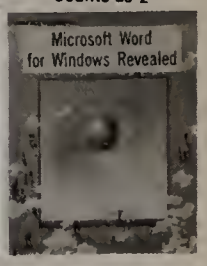

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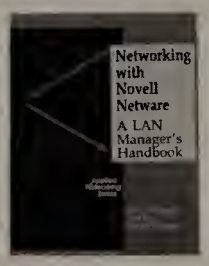

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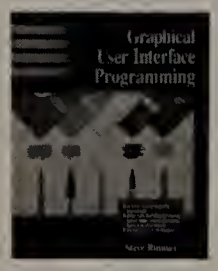

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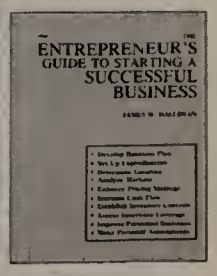

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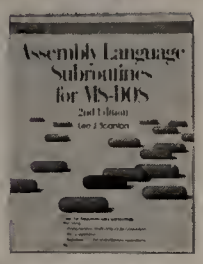

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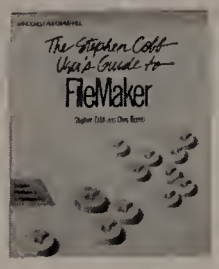

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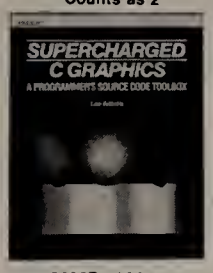
3989P $18.95



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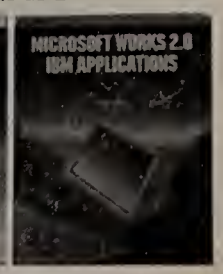

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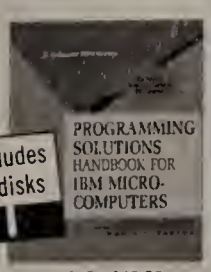

10035 $49.95
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881744-7P $19.95
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15057P $39.95
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9409 $34.95
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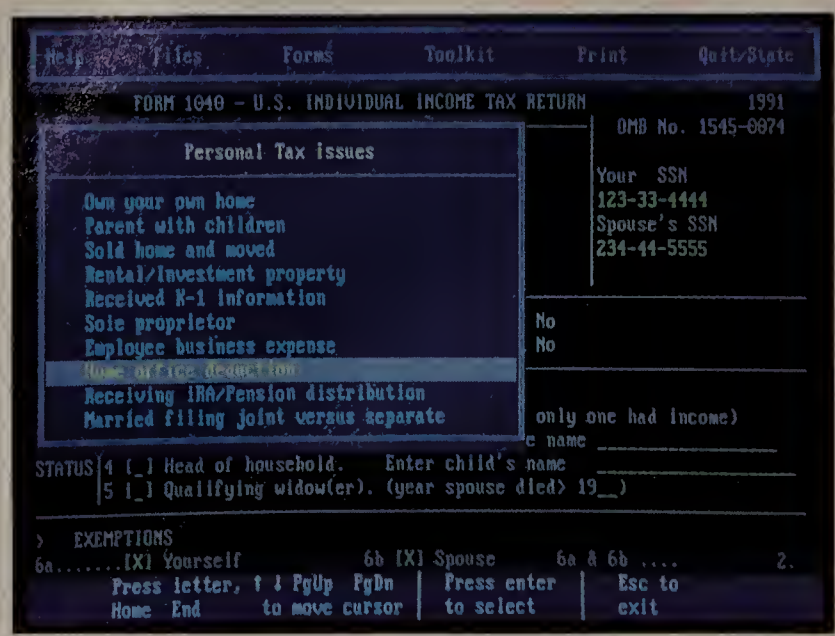
TurboTax 1991, Andrew Tobias' TaxCut 1991

Not Too Early to Plan for the Inevitable Chore



TaxCut (above) and TurboTax now include more tax forms and worksheets and offer beefed-up expert tax advice.

Happy New Year: It's the start of a new tax season. Although the clock is winding down to April 15, tax software purveyors can't ship final versions of their products until Uncle Sam puts the finishing touches on the 1991 tax code.

Knowing Congress, that may take another couple of months—time you could be using to get a head start on all that nastiness. Since the forms generally don't change much from year to year, two of the leading tax software vendors—ChipSoft and MECA Software—are offering early versions of their programs to let you get out in front of this irksome chore.

You can use ChipSoft's *TurboTax Headstart 1991* or the early release of MECA's *TaxCut 1991* for end-of-the-year tax planning and to begin entering info such as expenses and depreciation into your tax worksheets. Along about February, both companies will send free to all registered users the final versions of their products for a quick install to put the final touches on completed returns.

Both *TaxCut* and *TurboTax* will walk you through the setup of a personal information worksheet, taking you through different tax forms as appropriate. If you prefer, you can skip around by topic, with menus to lead you through the implications of, for example, purchasing a new home or filing taxes jointly. Both companies have beefed up the expert on-screen tax advice.

Both programs include more tax forms and worksheets, plus better coverage of topics like depreciation and amortization, partnerships, and Sub-Chapter S Corporations. It's now easier than ever to import data that you have generated all year long in personal finance managers like Intuit's *Quicken*, MECA's *TaxCut* companion program *Managing Your Money*, and even Microsoft's new *Money*.

When you're all done, the *TurboTax* Data Examiner or *TaxCut*'s Auditor reviews your return for missing entries and inconsistencies. These expert systems even suggest ways you could reduce your taxes and alert you to the red flags IRS auditors will be searching for.

ChipSoft's HeadStart Edition retails for $79.95, while the early *TaxCut 1991* sells for $89.95; buyers of either receive the final version free in the mail.

Filling out tax forms is daunting in any case, but tax programs make the job more palatable by letting you enter data randomly and periodically. You get the latest tax code updates, instant electronic access to IRS instructions, and expert system advice.

—*Mike Hogan*

IN BRIEF

TurboTax 1991, Andrew Tobias' TaxCut 1991

WINDOWS Get a jump on filling out your 1991 return with these tax preparation packages that also offer more tax help than in years gone by.

ChipSoft, Inc.
Personal Order Dept.
6330 Nancy Ridge Dr.
#103
San Diego, CA 92121
619/453-8722,
800/755-1040 (fax)
Reader service no. 726

MECA Software, Inc.
55 Walls Dr.
Fairfield, CT 06430-0912
800/288-6322
Reader service no. 727

FotoMan

Logitech's Digital Camera: PC Photos

With Logitech's FotoMan you can store the world on your notebook—or at least those Kodak moments.

This nifty $799 digital camera gives new meaning to "point and shoot." Using its automatic flash, you can snap indoor and outdoor digital photos, and then store as many as 32, at 376 by 276 resolution, on its 1MB RAM chip. FotoMan compresses the images and stores them at a maximum of 256 gray levels in the format of your choice, such as BMP, PCX, EPS, or three TIFF file formats.

To move the images onto your desktop, use *FotoTouch*, a *Windows*-based image editing package bundled with FotoMan that downloads images through your PC's serial port. The images are presented as preview thumbnails, from which you can select those you want to store on your hard drive. For hard copy, you can print them as graphic files or create negatives.

Imagine the applications: on-the-spot accident reports, inventory management, and an employee data base.

For easy on-the-fly photos, you can't beat FotoMan. The quality may not be as good as a Polaroid, but this is just the first frame of an entirely new roll for PC technology.

—*Susan Lusty*

IN BRIEF

FotoMan

Logitech takes computing one step beyond by creating an inventive device: a camera for the PC.

Logitech, Inc.
6505 Kaiser Dr.
Fremont, CA 94555
800/231-7717,
415/795-8500
Reader service no. 673

Need more room on your hard disk?

Doesn't everybody?!!

We all know the way things are going. Bigger, more complex programs that do more and do it easier. More pictures, charts, graphics and color. More things to do with bigger files and more data. More, more, more....

Which all leads to the inevitable. We all could use more disk space.

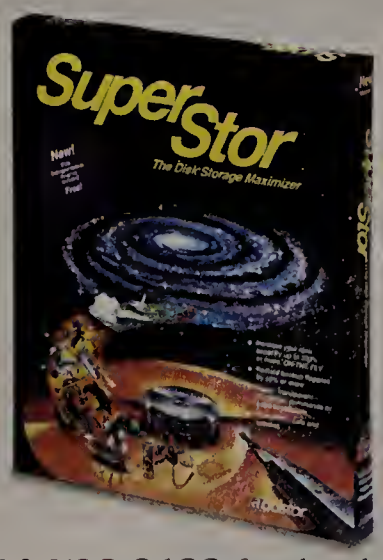
Increase Disk Space 2-3 Times with Complete Compatibility.

Now you can get rid of the disk space crunch, without even opening your computer. Just install SuperStor, the data compression program for PC/XT/ATs, PS/2s and compatibles that runs on DOS 3.2 to 5.0, Windows, and DR DOS.

SuperStor increases your hard disk capacity, ON-THE-FLY, up to 2-3 times! And it works on floppies, Bernoullis, and removable hard drives, too!

SuperStor is easy to install, safe, and reliable. We feature a 100% transparent, bootable C drive. And it's the ***fastest compression solution available!***

Once SuperStor is on your hard disk, no further steps are needed. You'll instantly gain up to three times more disk space. For your copy of SuperStor, contact your local dealer or call AddStor at



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Circle 2 on reader service card

AST Advantage Line

The Advantage of Plug-and-Play PCs

AST Research's Advantage product line is a suite of powerful, low-priced plug-and-play PCs that are so simple to use, they'll be sold in consumer electronic stores.

Targeted at small-business users and PC-proficient home workers, the Advantage line consists of four systems: 20-MHz 386SX desktop and notebook machines and 20-MHz 486SX and 25-MHz 486 desktops.

The entire Advantage line is preconfigured. Flip the power switch, and a custom shell will appear and guide you through the system setup. All models come with *Windows*, DOS 5.0, Microsoft's integrated business software package *Works*, and Microsoft's new accounting package *Money* installed. In addition, the 486 and 486SX machines come with *Winfax* for *Windows*, a communications software package for sending and receiving faxes.

In addition to its no-sweat setup, the Advantage 486/25 comes with 4MB of RAM, a 120MB hard drive, and a 9600-baud fax-modem.

The 486SX/20 and 486/25 both come with 4MB of RAM expandable to 16MB. Also standard are a 120MB hard drive and 1.44MB 3½-inch and 1.2MB 5¼-inch floppy drives, a 2400-baud data modem, a 9600-baud send/receive fax-modem, and a mouse.

The desktop 386SX/20 features 2MB of RAM expandable to 16MB, an 80MB hard drive, and both 1.44MB 3½-inch and 1.2MB 5¼-inch floppy drives. A 2400-baud modem and mouse are also included.

The NB-SX/20 notebook, which weighs 7.3 pounds, is a 20-MHz 386SX with 2MB of RAM expandable to 8MB, a 40MB hard drive, one 1.44MB 3½-inch internal floppy drive, a VGA display, and a 2400-baud internal modem. AST claims a battery life of 3 hours.

Technical support for the Advantage line includes one year of free on-site service for the desktop machines, in addition to the standard free unlimited phone support and fax and BBS access to AST technicians. AST gives the notebook computer the same 24-hour turnaround repair policy that it offers with its top-of-the-line Premium series, but the first year is free.

Prices range from approximately $1899 for the 386-SX/20 to $3395 for the notebook. —*Melissa Riofrio*

IN BRIEF

AST Advantage Line
The Advantage line features ready-to-run, high-performance, bundled machines with palatable prices for small businesses.
AST Research, Inc.
P.O. Box 19658
Irvine, CA 92713-9658
714/727-4141,
714/727-9355 (fax)
Reader service no. 665

QEMM-386 6.0

Addressing More Room at the Top

Even with DOS 5.0 and a hefty 4MB or more of RAM, you can still bump your head on that old 640K limit. There are just too many programs that want a piece of conventional memory. One way to maximize your memory is to use a 386 memory manager. These programs open memory addresses normally inaccessible to DOS and allocate them to RAM-resident programs and device drivers that would otherwise take memory from your precious 640K. The result, even if you're loaded with TSRs, can be 600K or more of space.

QEMM has long been the leader in this market, and thanks to a variety of new tricks, *QEMM 6.0* makes more RAM available than ever before. For instance, TSRs that need more RAM when loading than when running now get what they need only when they need it. For *Windows 3.0* users, *QEMM* shrinks enhanced mode's conventional RAM requirements by as much as 24K. And *QEMM* can hide ROM code, with a net gain of 32K to 100K, depending on your computer.

QEMM does more than open up RAM. The bundled *Optimize* program, which tests your CONFIG.SYS and AUTOEXEC.BAT files to find the best place in memory for your TSRs, has been improved, so loading TSRs in high memory is easier than ever. Moreover, the program now excludes areas in memory that may cause conflicts and provides what-if tools.

Much of *QEMM 6.0*'s new technology is being incorporated into other Quarterdeck programs. *Desqview 2.4* can load more of itself into high memory than earlier versions could, while *Desqview 386 2.4* comes with a complete copy of *QEMM 6.0*. Both *QEMMs* retail for $99.95. *Desqview, Desqview 386*, and *QRAM* retail for $129.95, $219.90, and $79.95, respectively.

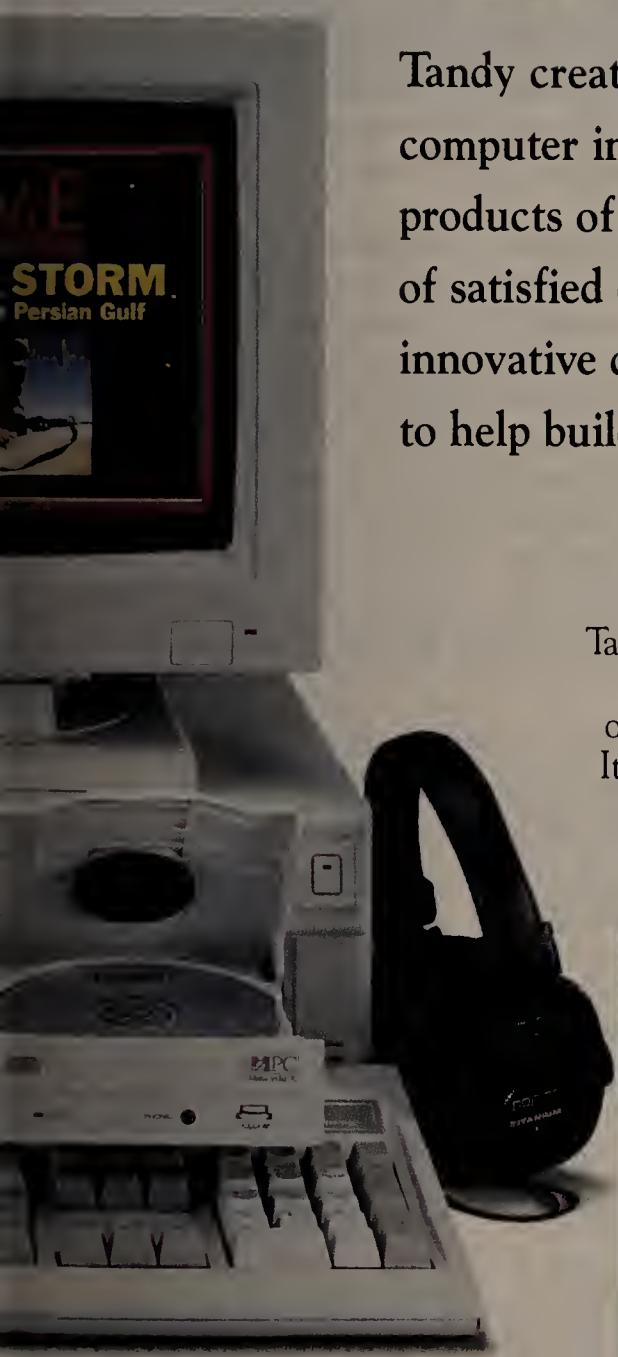
—*Lincoln Spector*

IN BRIEF

QEMM-386 6.0
This new version of an old memory manager gives you up to 200K extra for TSRs and device drivers and is also easier to configure.
Quarterdeck Office Systems Inc.
150 Pico Blvd.
Santa Monica, CA 90405
213/392-9851,
213/399-3802 (fax)
Reader service no. 679

TANDY Engineered It

Tandy created the first mass-produced, nationally marketed personal computer in 1977, and has been a leader ever since. By manufacturing products of uncompromising quality, Tandy has built a large following of satisfied customers. And through innovative design, Tandy continues to help build the future:



The systems approach to home computing

Tandy software engineers designed special applications software for our home computer; IBM didn't. It's so easy to use, your success in using any Tandy® 1000 RL is actually guaranteed.

Pioneering the notebook PC industry

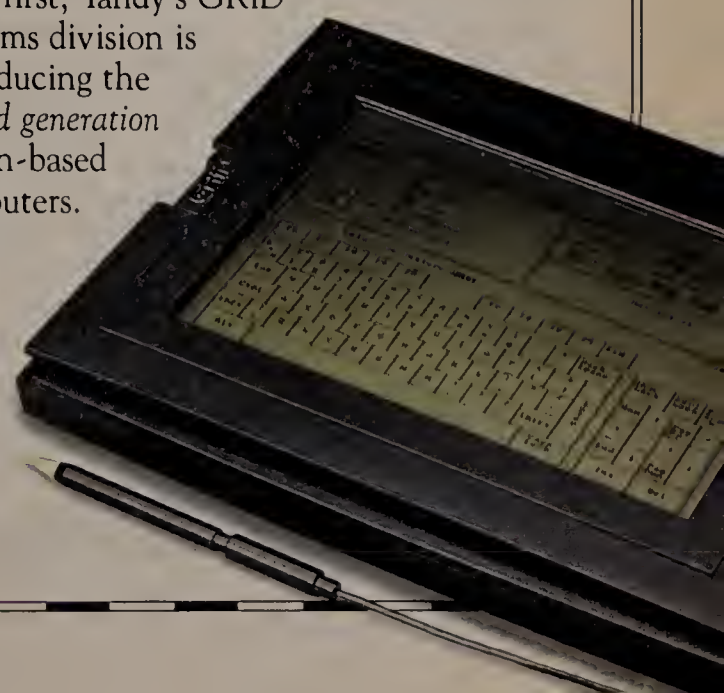
Tandy's Model 100 helped define this market in 1983. Users depend on Tandy for innovative features and a rugged case that's built to last.

Tandy jointly developed the Multimedia PC Standard

And now Tandy is first to present a complete line of computers with the added dimension of this exciting technology. Tandy engineers even designed an affordable upgrade that brings multimedia to existing PCs.

Writing the future

While others prepare to ship their first, Tandy's GRiD Systems division is introducing the *second generation* of pen-based computers.



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A DIVISION OF TANDY CORPORATION

Circle 284 on reader service card

The Far Side Computer Calendar

Dinosaurs, Ducks, and Buffalo Paper

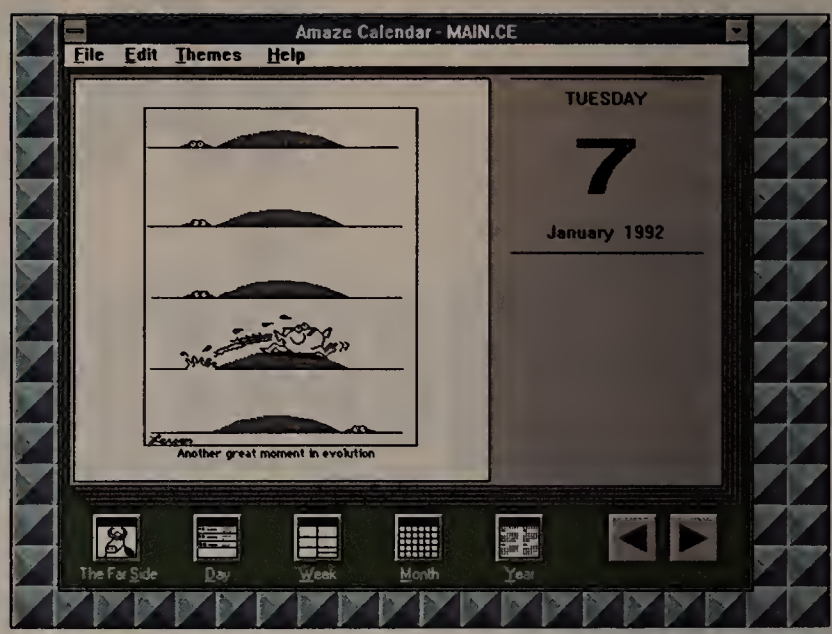
Computer-based calendar programs have any number of advantages over the paper ones you hang on your refrigerator—built-in alarms and instant rescheduling are just two that spring to mind. But computer calendars don't have a sense of humor; there's no place in them for saber-toothed tigers; perplexed, chubby kids; or clumsy monsters that go bump in the night.

Amaze, Inc. and cartoonist Gary Larson have joined forces to solve this regrettable problem, creating *The Far Side Computer Calendar.* Now you can track appointments, schedule recurring events, and set alarms (complete with Mozart and reveille) and still be able to observe dancing cows, early microscopes, and Dick Clark aging 200 years in 30 seconds. If you're lucky, a caveman tied to a large stone wheel will roll across your screen while you're deciding which of your Monday morning appointments is worth keeping.

As a practical tool, *The Far Side Computer Calendar* doesn't match up to more serious programs like Campbell Services' *On-Time for Windows. Far Side* does nothing to warn you about overlapping appointments, for instance, and it is relatively difficult to navigate (in *On-Time,* you can get back to "today" with one mouse click; *Far Side* requires four). But then, *On-Time for Windows* won't bring you animal game shows, and that should count for something.

Included in the $69.95 list price is one year's worth of Gary Larson cartoons; refills will be available at a yet-to-be-determined time and price. The product requires a hard disk, EGA or better graphics, and a warped sense of humor.

—*Lincoln Spector*



The Far Side Computer Calendar helps you track appointments and schedule events—and features a bizarre mix of dancing cows and other beasties.

IN BRIEF

The Far Side Computer Calendar

WINDOWS "65 million years ago, when cows ruled the earth," you couldn't get a calendar like this to run on your computer.

Amaze, Inc.
11810 115th Ave. NE
Kirkland, WA 98034
206/820-7007,
206/823-0568 (fax)
Reader service no. 677

ExpressWriter 201

Dealing With Portable-Printing Power

If portable printing were simply a question of inches and ounces, Toshiba's new ExpressWriter 201 could win the lightweight championship. It weighs in at a scant 1.8 pounds and takes up only 11.9 by 3.2 by 1.7 inches without its optional nickel-cadmium battery. Even with its wallet-size AC adapter, this printer leaves plenty of room in your briefcase for, say, your Toshiba T2200SX.

Add the battery, though, and the ExpressWriter comes closer to the size and traveling weight of other portables, such as Citizen's 11.7-by-3½-by-2-inch, 2½-pound PN48. Both the ExpressWriter and the PN48 are far lighter and offer better laserlike print quality than most other portable printers, but it's hard to give either a clear advantage. It depends on what features are important to you.

Are you planning to print overheads for a last-minute presentation on the plane or on the way from the airport? The ExpressWriter's 10-ounce nickel-cadmium battery gives you up to 2½ hours of battery-powered text printing and at least an hour with graphics—an average of about 25 pages per charge.

The ExpressWriter has a straight paper path and will print graphics on any flat stock using a thermal transfer ribbon cartridge (or on thermal paper without the ribbon). But so will Citizen's PN48, and its thermal fusion ink technology yields 360-dpi resolution for graphics, compared to the ExpressWriter's 180 dpi. Still, the ExpressWriter can print your charts and graphics 9 inches across, while competitive portables can print across only 8 inches.

If you want letter quality throughput for printing proposals or contracts right at your customer's office, the ExpressWriter will zip out 12 characters per inch at a respectable 63 characters per second and 10 characters per inch at 53 cps in Courier and Prestige Elite fonts, or in draft mode with a 2K buffer for print spooling.

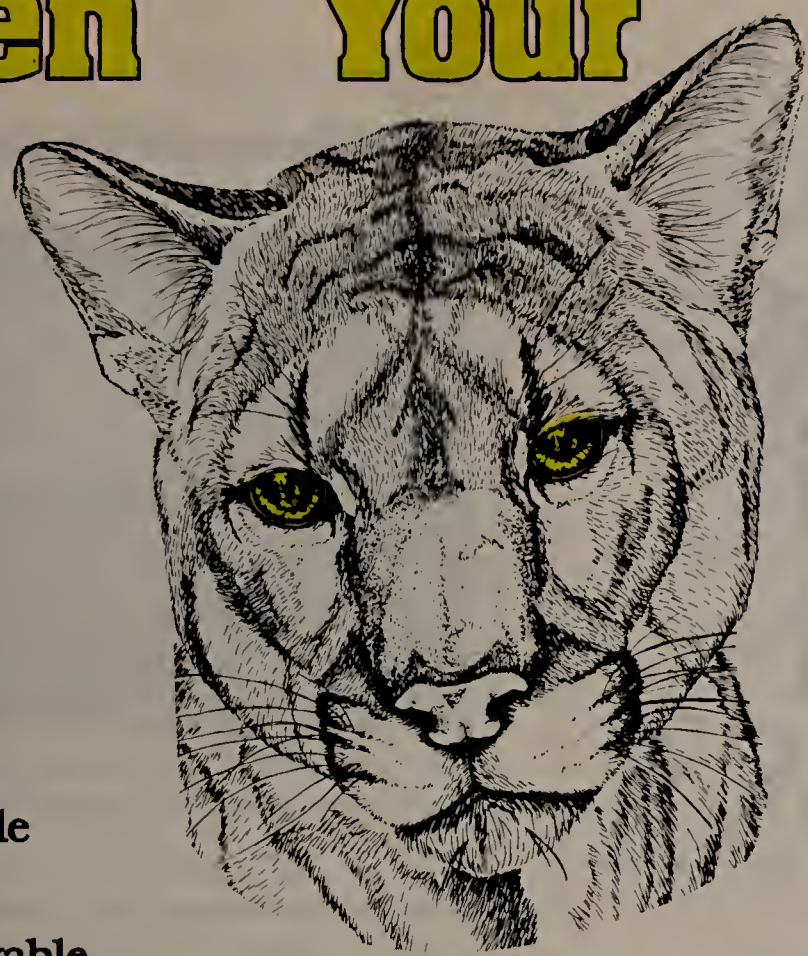
The ExpressWriter's price is competitive with those of other portable printers on the market—$499 without its $125 optional battery. Citizen, for instance, prices its PN48 at $469 without battery. While the ExpressWriter may cost a little more and have lower resolution than the competition, it prints text as well as any of the new breed of portable printers, and it's very light. All in all, the ExpressWriter is a handy device that's ideal to take on the road or even to keep as one of the components of your home desk-drawer office. —*Mike Hogan*

IN BRIEF

ExpressWriter 201
Another small, light portable printer with 180 dpi and a 9-inch paper path.

Toshiba America Information Systems
P.O. Box 19724
Irvine, CA 92713-9724
800/457-7777,
714/583-3000
Reader service no. 666

Open Your Eyes



General Ledger

Payroll

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Accounts Payable

Accounts Receivable

Purchase Order

Invoicing

LYNX

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Circle 56 on reader service card

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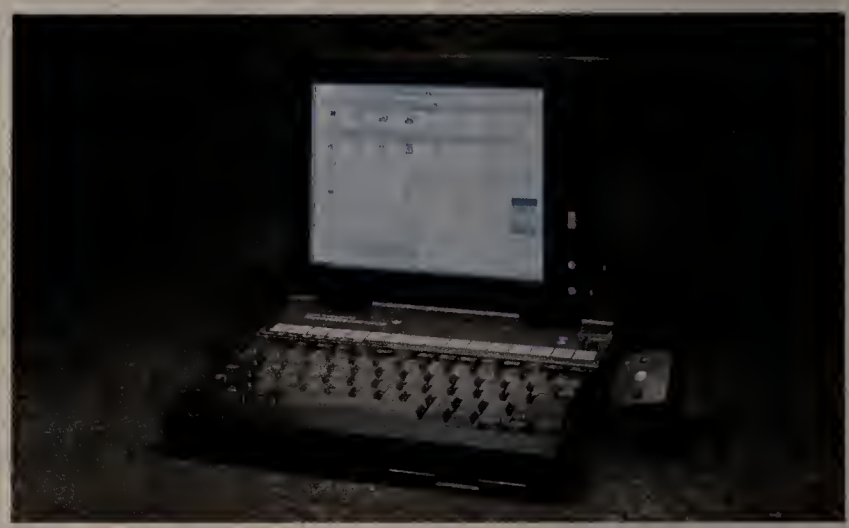
Paul Somerson
PC Computing
July 1991
MS-DOS 5 Review

Microsoft

TravelMate 3000 WinSX

Take Windows With You in a Notebook



The TravelMate 3000 WinSX features an improved BIOS to get Windows up and running faster and new software drivers to conserve battery life.

You can buy a notebook computer, and you can buy *Windows 3.0,* but you can't necessarily make them work well together. The $3499 TravelMate 3000 WinSX, however, is a notebook well tailored to the special needs of using *Windows* on the road.

Right off the bat you'll notice a difference. Waiting for *Windows 3.0* to start can be a mind-numbing experience for notebook users. TI gets you out of limbo a little faster by tweaking the BIOS: It takes just 40 seconds to get *Windows* running.

Working with *Windows* on a notebook is a short experience because the program's frequent screen addressing inhales battery power.

TI stops the battery drain with a set of software drivers that conserve battery power by suspending a *Windows* application, turning off backlighting, and letting the disk spin down at your command—automatically or when you drop the clamshell cover. A keystroke then auto-resumes where you left off.

As a result, TI claims you'll get 3 hours or more of useful computing—depending on how much time you spend suspended—from its nickel-cadmium battery pack. That's a 50 percent improvement over most other laptops running *Windows*, according to TI.

The WinSX has the same 20-MHz 386SX CPU as its cousin the 3000, and an identical 10-inch 640 by 480 VGA display with 32 gray scales. The 5.7-pound notebook (6.8 pounds with AC adapter) comes with *Windows 3.0* and DOS 5.0 loaded and 4MB of memory expandable to 6MB. TI has also added its largest notebook hard drive, a 60MB model, and a thumb-operated TravelPoint trackball.

—*Mark Henricks*

IN BRIEF

TravelMate 3000 WinSX
This notebook offers a hardware platform and software features to make *Windows 3.0* run smoothly on batteries.

Texas Instruments, Inc.
Information Technology Group
P.O. Box 202230, ITG-9130
Austin, TX 78720-2230
800/527-3500
Reader service no. 672

IBM LaserPrinter 4029 Series

Lots of Good, Cheap Printing Options

Aggressive pricing, impressive functionality, and a broad range of upgrade options characterize the new IBM LaserPrinter 4029 series from Lexmark. The new line of four machines ranges from a 5-ppm single-user model ($1595) to a 10-ppm LAN-compatible workhorse ($2995).

The 4029 series is both an upgrade to IBM's 4019 laser printer line and an auspicious beginning for Lexmark. The fledgling company, formerly IBM's printer division, was spun off earlier this year and retains close ties to Big Blue.

Each of the four units—Models 5E, 6, 10, and 10L—comes standard with 1MB of RAM expandable to 9 MB, a 200-sheet paper tray, and an improved LCD operator panel. They have the same 14.2-inch-by-20.6-inch footprint. The 10L is taller and comes with an extra 500-sheet paper tray. Inside, the Models 5E and 6 are powered by the Motorola 68000 processor, while Models 10 and 10L feature the speedier 16-MHz 68020 chip. All the printers come with ultra fast parallel (150 kbps) and serial (38.4 kbps) ports.

Like Hewlett-Packard's LaserJet III series, the Lexmark 4029 printers offer an improved printing technology that provides sharper resolution and eliminates the jaggies on fonts at 300 dpi. Resolution freaks might choose the 600-dpi option (on the Model 6 and up), which requires an extra 4MB of RAM ($799) and a user-installable PostScript board ($898). Lexmark claims its PostScript board runs about 45 percent faster than HP's PostScript cartridge.

To get an extra performance boost, you can upgrade your Model 6 to a Model 10 by switching to a 68020 processor board ($700).

Each Lexmark 4029 printer comes with 10 bit-mapped fonts and 16 Adobe Type 1 outline fonts resident. Also included is built-in support for HP's LaserJet II Printer Command Language (PCL 4) and IBM's Personal Printer Data Stream (PPDS) page description language. Support for HP's newer PCL 5 language is a user-installable option ($199).

Although the 10L has a cheap base price, you'll have to add a lot of expensive options to make it truly LAN-ready. These options include the LAN Connection adapter, additional memory, and the Hewlett Packard PCL 5 or the Adobe PostScript board. These add-ons make the printer more pricey.

For expanding offices, Lexmark has designed the 10L to work with IBM's LAN Connection, a separate unit that lets you hook printers to ethernet or token ring networks without using a dedicated print server. The connection costs $845 for ethernet and $945 for token ring.

Lexmark's printers offer competitive base prices and an impressive collection of mix-and-match upgrade options.

—Jeff Bertolucci

IN BRIEF

IBM LaserPrinter 4029 Series
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Lexington, KY 40511
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Reader service no. 667

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David P. Chernicoff
PC Week
June 10, 1991

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Scott Spanbauer
PC World
July 1991

Microsoft

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Paul Bonner
PC Computing
July 1991

Microsoft®

"Transition to MS-DOS 5 is proving to be as painless as promised."

Stuart J. Johnston
InfoWorld
July 29, 1991

Microsoft®

BusinessStation 486ASX, PowerPro Array

ALR's Pizza Box and Twin-Spin Server

The pizza box–size ALR BusinessStation 486SX leaves enough room for both 3½-inch and 5¼-inch drives and up to 33MB of memory.

To outfit a network with workstations and file servers, you have to know both ends of the PC technology spectrum. With its latest offerings, ALR provides the full range with a server challenge to Compaq and a 486SX workstation that gives you more for less.

In fact, the first thing that attracts you to the BusinessStation 486ASX is the price—$1995 for a 1.44MB floppy-only 20-MHz 486SX. Under the hood, though, you'll find more than just another cheap workstation. The 486-ASX has a 32-bit EISA bus, an integrated 16-bit 800 by 600 256-color super-VGA video controller, and ALR's integrated direct memory access interface, which supports an IDE drive controller that ALR says is three times faster than standard IDE.

Although the workstation comes with a scant 1MB of memory, it's expandable to 33MB using standard SIMMs. Despite its pizza box design, the workstation still has room to add a 3½-inch third-height drive and a 5¼-inch half-height drive.

Two 32-bit proprietary slots hold the upgradable CPU module and an optional 64K secondary cache module ($295). A pair of 32-bit EISA slots will accommodate standard network interface cards.

IN BRIEF

BusinessStation 486ASX, PowerPro Array

ALR brings new computer technology to both low and high ends with an EISA-based 486SX workstation and a twin-processor file server.

Advanced Logic Research, Inc.
9401 Jeronimo
Irvine, CA 92718
800/444-4257,
714/581-6770
Reader service no. 671

A fifth slot is available for high-performance proprietary ALR 8/16-bit cards that come in SCSI controller, fax-modem, scanner, and ethernet adapter flavors.

The BusinessStation 486-ASX with a 20-millisecond (ms) 80MB IDE drive is $2995. Add another $300 for a 14ms 200MB direct memory access IDE drive. You can upgrade to a 25-MHz 486 CPU by replacing the chip, or go to a 33-MHz or 50-MHz 486 by adding a whole new CPU module. Outfitted with a 50-MHz 486 CPU, the BusinessStation is priced at $4995 with floppy only and $5695 with a 20ms 80MB IDE drive.

The floor-standing PowerPro Array is a twin-processor EISA "superserver" that is compatible with Compaq's Systempro, according to ALR. It's designed to reduce processor bottlenecks, particularly on LANs.

If you run a multiprocessor-capable network operating system such as *OS/2 LAN Manager* or Banyan's VINES SMP, you can implement a pair of 33-MHz or 50-MHz 486 CPUs, each supported by 512K to 1MB of read/write-back cache.

The 12-slot PowerPro comes with ALR's 32-bit disk array, which controls up to four 340MB IDE drives.

The $22,995 PowerPro Model SMP 512/1360 is targeted as a midrange replacement. —*Mark Henricks*

ReadStation

Scan a Minute

If your company uses its scanner as much as its copy machine, Umax's ReadStation can make scanning a page as easy as making a copy. With Caere's *OmniPage*, optical character recognition software, and a 2MB 3½-inch floppy drive built in, this standalone scanner can read printed or typed documents onto a floppy in a matter of minutes and still retain your document's format.

You can access most of the scanner's features from the front control panel. For instance, with the push of a button you can preset ReadStation to save your documents in specific application formats, such as ASCII, *WordPerfect*, *Word*, *WordStar*, *1-2-3*, *dBASE*, and others. You can also select the size of the page to be scanned, modify brightness levels, and select portrait or landscape.

Once you have ReadStation configured, you can use *OmniPage* to maintain your document's format. Your page can have up to nine columns of text and point sizes ranging from 6 to 72—boldface, tabs, superscript, italics, and the like are not lost either. You can also capture small graphics, such as clip art, and save them as TIFF files. This all-in-one scanner could help clear a cluttered paper office, but it comes at a price—$5495. However, if you need to create an archive or have too many files and not enough file cabinets, ReadStation can save you a lot of time transferring files from paper to screen. —*Susan Lusty*

IN BRIEF

ReadStation
ReadStation keeps your scans rolling by offering a one-button solution.
Umax Technologies, Inc.
2352 Walsh Ave.
Santa Clara, CA 95051
800/562-0311,
408/982-0771
Reader service no. 674

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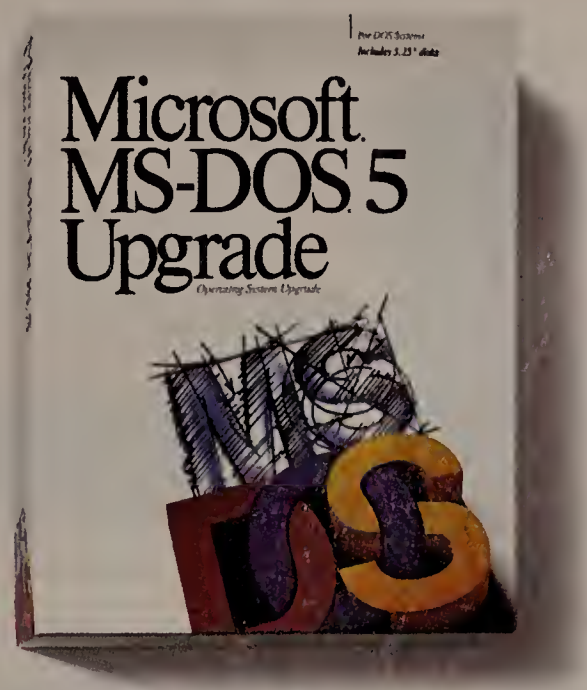

No PC should be without it.

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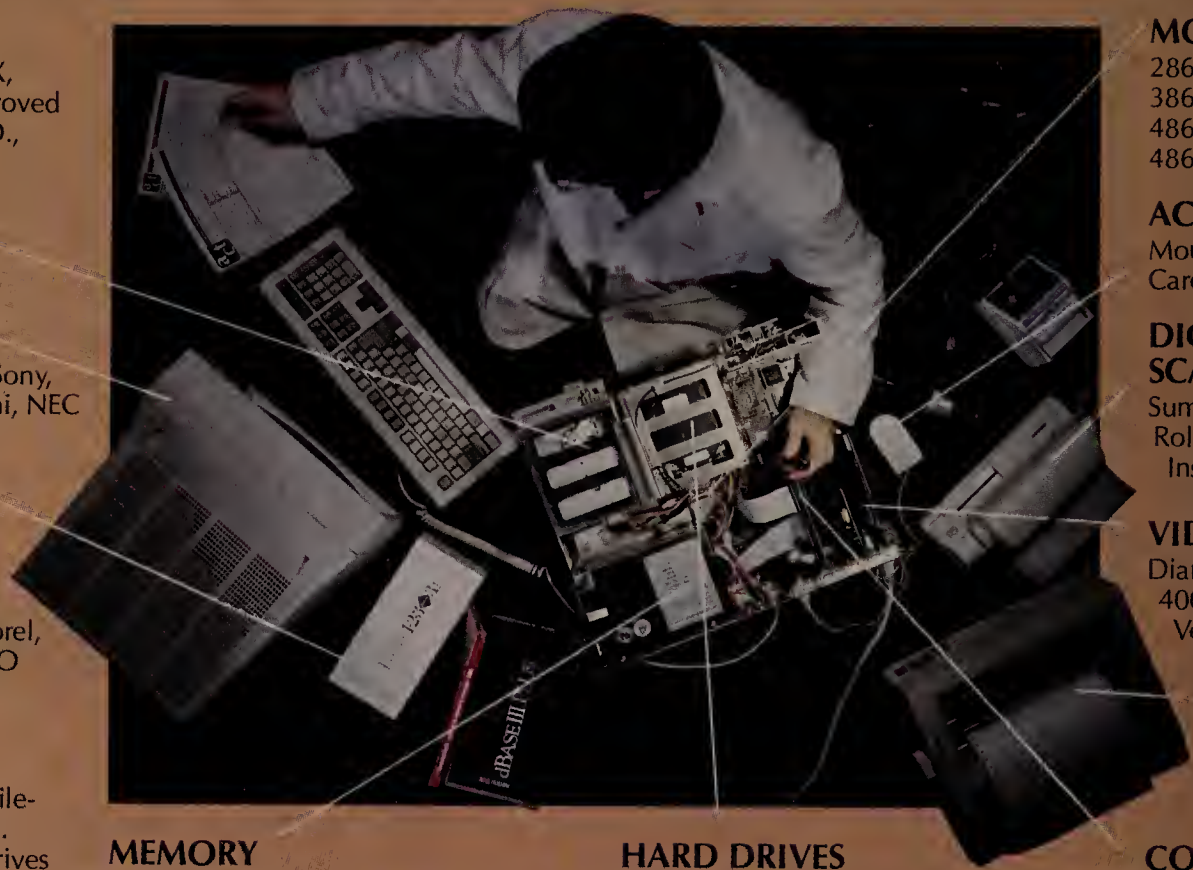
NETWORKING
Novell, Unix, Xenix. Completely configured file-servers and workstations. Software loaded, hard drives compsurfed, network cards installed and tested, cabling prepared.



MOTHERBOARDS
286-16, 386SX-16, 386-SX20&25&33 Cache, 486-25&33 ISA Cache, 486-25&33 EISA Cache

ACCESSORIES
Mouse, Trackballs, FAX Cards, Modems, Keyboards

DIGITIZERS, PLOTTERS, SCANNERS
Summasketch, Kurta, Calcomp, Roland, HP, Houston Instruments, Mitsubishi

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PRINTERS
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ACT 386™-33 CACHE SYSTEM

- Intel 80386-33MHz CPU
- 64K Cache Memory
- 4MB 80ns RAM (exp. to 32MB)
- 1.2MB & 1.44MB Floppy Drives
- 210MB IDE Hard Drive (15ms)
- 2 Serial Ports/1 Parallel Port
- AMI Bios
- Enhanced 101 or 102 Keyboard
- ACT SVGA Monitor (1024x768, .28mm d.p.)
- Super VGA Video Adapter w/1MB
- Choice of Tower or Desktop Case
- Microsoft DOS 5.0
- Microsoft Windows 3.0
- Microsoft Serial Mouse
- Free Delivery
- Wide Variety of Custom Options

"ACT's 33MHz mini-tower is a class act all the way around. The ACT 386-33FC is a well-made machine with easy drive access, good performance, and impressive attention to construction detail. This computer is easy to recommend."
PC MAGAZINE December 25, 1990

$2,795

ACT 486™-33 CACHE SYSTEM

- Intel 80486-33MHz CPU
- Cache: 128K (ISA) 256K (EISA)
- 4MB System RAM (exp. to 32MB)
- 1.2MB & 1.44MB Floppy Drives
- 210MB IDE Hard Drive (15ms)
- 2 Serial Ports/1 Parallel Port
- 8 ISA Slots or 8 EISA Slots
- Enhanced 101 or 102 Keyboard
- ACT SVGA Monitor (1024x768, .28mm d.p.)
- Super VGA Video Adapter w/1MB
- Choice of Tower or Desktop Case
- Microsoft DOS 5.0
- Microsoft Windows 3.0
- Microsoft Serial Mouse
- Free Delivery
- Wide Variety of Custom Options

$3,295 ISA 128K Cache

$4,195 EISA 256K Cache Up to 64 MB

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Portable Office in a Briefcase

All your major office tools in one compact, durable case:

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History is littered with the bones of great men who thought their achievements would live forever. Now you can succeed where they failed as MicroProse brings you Sid Meier's **Civilization.** Guide a culture from its earliest stages, through agricultural and industrial revolutions, all the way to your own Space Age. Survive and dominate by outmaneuvering mankind's most legendary leaders. Carve your name indelibly in the pages of history. With Sid Meier's **Civilization,** you really can build a brave new world.

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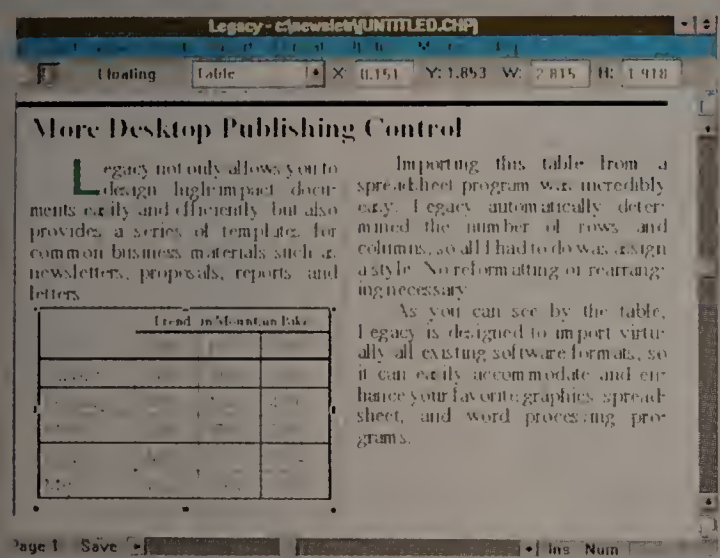
UPDATE

New Versions of Your Favorite Products

Legacy 2.0



NBI's Legacy 2.0 includes a new floating frame that moves down the page as you add text.

WINDOWS Hot on the trail of *Word for Windows 2.0* and *Ami Pro 2.0* comes *Legacy 2.0*. The new version of the *Windows* word processor includes much-needed macro improvements and powerful new desktop publishing tools.

The biggest improvement is the addition of a powerful BASIC-like macro language that comes with an on-line debugger. Managing your files is easier too, with a new document manager that lets you search for files among multiple directories and drives.

In the desktop publishing arena, *Legacy 2.0* adds new graphic tools. Now you can crop and reverse images as well as enhance the resolution, brightness, and contrast of bit-mapped images. And you can have up to 256 colors in a single image. Additional features include a floating frame that moves down the page as you add text and a fixed frame that stays in one place while the text flows around it.

Legacy 2.0 sells for $495; *Legacy* and *WordStar Legacy* users can upgrade for $99. A net version is available. NBI, Inc., 3375 Mitchell Ln., Boulder, CO 80301; 800/624-1111, 303/938-2791 (fax).

Reader service no. 682

PCL 5 Cartridge

Now you can get Hewlett-Packard's PCL 5 printer language, found in the LaserJet III, IIIP, IIID, and IIISi printers, as an upgrade for your LaserJet IIP. HP's $299 cartridge gives you built-in CG Times and Univers typefaces in regular, bold, italic, and bold italic treatments, scalable in 0.25-point increments up to 999.75. You also get compatibility with other downloadable fonts and HP-GL/2 for mixing graphics with text. You'll need at least 1.5MB of printer memory, which is available as a 1MB board upgrade for $230 or a 2MB upgrade for $390. Hewlett-Packard, 19310 Pruneridge Ave., Cupertino, CA 95014; 800/752-0900, 208/323-2551.

Reader service no. 683

DeScribe 3.0

WINDOWS For companies that have a foot in OS/2 and *Windows* worlds, *DeScribe 3.0* is a good two-for-one deal. For the price of the *Windows* package, you get the OS/2 version free in the same box.

Both versions have the same interface, and files can be shared transparently between them. Although primarily designed for word processing, the product features plenty of desktop publishing power. *PageMaker*-like text formatting icons can be moved out of the way, and vertical and horizontal rulers let you format text and graphics and set up columns. While *DeScribe 3.0* isn't as consistently intuitive as it could be (you have to work with dialog boxes to align tabs, for example), the $495 price for both versions is inviting for those in mixed-platform environments. DeScribe, Inc., 4047 N. Freeway Blvd., Sacramento, CA 95834; 916/646-1111, 916/923-3447 (fax).

Reader service no. 684

VINES 4.11

Version 4.11 of Banyan's VINES network operating system expands its support for multiprocessing servers such as AT&T's symmetric StarServer E and higher-capacity storage devices such as Compaq's Intelligent Drive Array. Also included is support for diskless client workstations, remote booting, and a broader array of LAN adapters.

VINES 4.11 is priced at $2495 for ten users, $7495 for an unlimited license, and $13,995 for a symmetric multiprocessing version. Updates to those versions are $750, $2250, and $4200, respectively, or free to VINES service subscribers. Banyan Systems, Inc., 120 Flanders Rd., Westboro, MA 01581; 508/898-1000.

Reader service no. 685

ACT 2.1, 1stACT

Contact Software Int'l has added macros and fax capability to version 2.1 of *ACT*, its contact management program, and introduced an entry-level version of the product called *1stACT* for the small business start-up or home user. *1stACT* lacks some *ACT* features but includes a contact data base, a calendar manager, a predefined report generator, and a word processor.

Version 2.1 gains add-ons that include the *Direct Link* serial cable transfer utility (without cable) and the *Books, Cards & Labels* program for addressing envelopes and creating Rolodex cards and labels and other common forms. It also includes support for the new ACT Development Language for creating more custom *ACT* solutions. Version 2.1 retails for $395, *1stACT* for $79.95. Contact Software Int'l, 1625 W. Crosby Rd. #132, Carrollton, TX 75006; 800/365-0606, 214/418-1866.

Reader service no. 686

For more information about any product, contact the manufacturer or circle the number on the reader service card.

After I Bombed with dBASE, I Almost Gave Up Automating Our Invoices...

Simpler Than dBASE & Paradox — More Powerful Than Q&A!

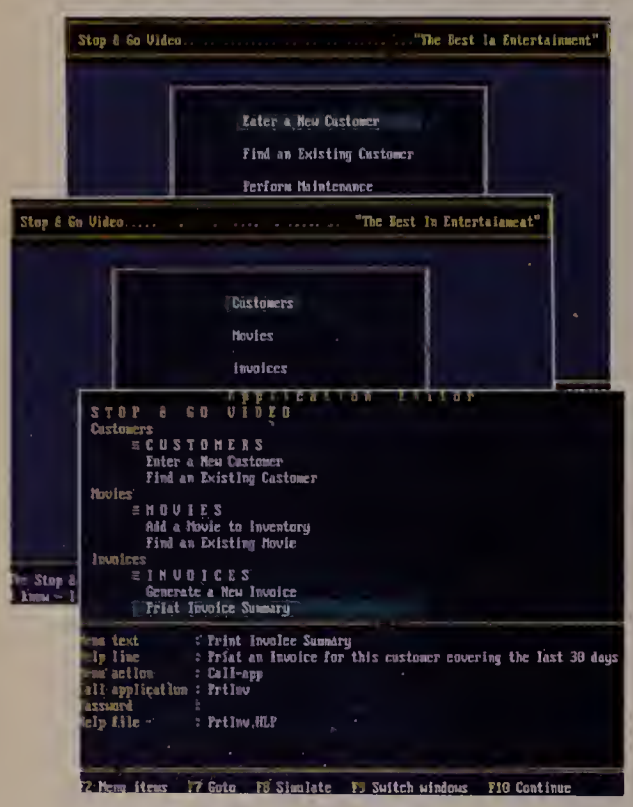
At our Monday morning staff meeting, I announced I was going to automate our invoicing system later that afternoon. Skepticism ran high. "Paul, you promised me an application like that two years ago," said Marge. "You couldn't do it and neither could that dBASE programmer you hired. It'll never happen."

On the other side of the room, Tim, a new employee whispered to Richard, "I didn't know the boss was a programmer too." "He's not," said Richard. "Couldn't write code to save his life. But he keeps trying because he thinks it's vital to the business."

I had already tried three times before to program a database: first with dBASE (much too complicated). Then I tried Q&A (not powerful enough). Then I bought Paradox (just like dBASE). All were either too complicated or not powerful enough.

This time I was confident. Why? Because I just bought Alpha FOUR, the powerful database for non-programmers like me. I spent 45 minutes over the weekend with Alpha FOUR's audio cassette tour. So I knew how easy application designs with Alpha FOUR would be, even the first time. I knew within hours, I'd be able to build a fully relational customer tracking and billing system, complete with custom menus, beautiful screens, extensive help messages and automatic error-correction for trouble-free data entry. And that's exactly what I did. You should have seen Marge's face when the first, perfectly formatted invoice came off the printer!

I Developed My Program in Minutes.



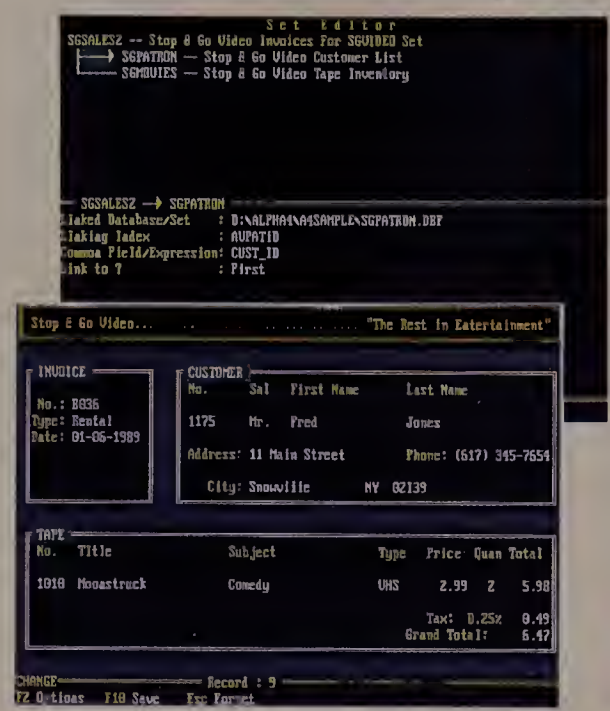
First, I needed a system of menus and sub-menus. Was I ever surprised to see how easy that was! With Alpha FOUR's "Application Editor" I wrote an outline of my menus and sub-menus. (Look at the screen.) Alpha FOUR automatically created my multi-level menus right from there. Changing my menus was just as easy. I inserted and moved a few around until I got it just right — nice and simple for my new employees.

I Made My Data Entry Bulletproof.

I've got a high employee turnover rate, so I needed something simple that a new hire could run right from the screen. I wanted my system absolutely safe and secure, so no "accidents" or mistakes could damage the data I've worked so hard to gather. That's when I really started to appreciate the well-thought-out way Alpha FOUR works. The "validation" capabilities ensure data gets entered correctly. I set it up so Social Security numbers must be 9 digits long (otherwise a custom error message is displayed).

When I enter a new customer, Alpha FOUR automatically skips over unneeded fields (determined by my validation rules). And best of all! — I use "lookup" fields whenever I can. So when I get to the "Customer Type" field, a window pops up with my choices. All I do is highlight and hit ENTER. No chance of an error!

I'll Never Enter Data Twice Again.



I always ran out of power with other simple-to-use databases; they weren't relational, meaning I couldn't link up separate files that share a common field. But with Alpha FOUR I easily created different databases for customers, invoices and inventory, and linked them all together just by drawing the links between the databases on the screen. (Look at my screen.) Now, we never have to enter the same information twice. I can display and edit information from up to 10 databases on one screen all at the same time. Before, when I changed a customer's address, I had to do it in 3 different places. Never again. And my database files are so much smaller now — because the actual data is only stored in one database.

Forms and Reports Look Great!

Alpha FOUR's Report Writer was even more impressive. I "painted" reports and invoices on-screen. They looked exactly like I wanted them to — much better than our old paper forms. This "What You See Is What You Get" approach to report writing gives me the flexibility I need to create meaningful and detailed reports that really get my point across.

Totally dBASE Compatible.

I was delighted to hear Alpha FOUR is totally compatible with dBASE .dbf files. Our mailing list went right into the new application without even having to be converted! And when my Alpha FOUR application grows, it'll import those Lotus 1-2-3 files used over in accounting. In fact, Alpha FOUR can import and export Lotus 1-2-3, Symphony, VisiCalc, PFS, MultiMate, WordPerfect and other packages.

And Now I Get Fancy...

First I breezed through the tutorial just to get a fully operational application, but now I have the time to dress it up and make it fancy. First I'll change my menus to 3D boxes for the menu selections, and change some of the colors here and there. Alpha FOUR makes it all so easy. Then I'll customize some of the data entry screens so they look just like the paper forms the employees are used to working with. I know — I'll call up Alpha's free Bulletin Board Service and get some tips from other Alpha FOUR users.

Alpha FOUR is loaded with all the power I need:

- 128 Fields Per Record
- 256 Characters Per Field
- 4,000 Characters Per Record (besides Memo Fields)
- Unlimited Records Per Database
- Field Types: Character, Numeric, Date, Logical, and Memo
- Variable Length Memo Fields, up to 5,000 Characters
- More than 50 Data Manipulation Functions
- Up to 10 Databases Per "Set"
- Unlimited Number of "Lookup" Databases

With menu-driven ease, I create applications with Alpha FOUR that before I never thought possible. I don't need to be a programmer — I only need to know what I want to create. Alpha FOUR takes care of the rest. Now that I'm an experienced Alpha FOUR user (after just 2 months), I look for things to organize and put on the computer. I don't need a programmer. I do it myself.

PC WEEK *Rated #1*

PC WORLD BEST BUY · INFOWORLD EXCELLENT VALUE

SPECIAL PRICE $549 VALUE JUST $99.00!

Alpha FOUR Version 1.1

BAE3455-5 **Alpha FOUR V1.1** 5¼" **$99.00**
BAE3455-3 **Alpha FOUR V1.1** 3½" **$99.00**
Regular Tiger price $319. Hard disk, 360kb, MS-DOS 2.0 or above, 512kb RAM. Includes over 40,000 Zip Codes with corresponding cities and states — completely cross-referenced for easy fill-in.

**Qualifying packages include programming databases (dBASE II, III and IV, Paradox, Clipper, Foxbase Fox Pro, Revelation, etc.), flat-file databases (Q&A, PFS:Professional File, Rapid File, etc.), integrated packages (Microsoft Works, PFS:First Choice, Lotus Works, etc.), and mailing list managers (FastPak Mail, etc.) or spreadsheets with databases (Lotus 1-2-3, Quattro Pro). Retail price $549. This is a competitive upgrade.*

SAVE $450 With This Ad!

NOW JUST $99!

If you already have any database software, integrated package* or mail list manager, or if you are currently using your spreadsheet to manage data, you can upgrade to Alpha Four for just $99.

Risk-free, 60-day money-back guarantee. Limit one per customer. Offer good through January 31, 1992. ***Sorry shipping is not included on this offer.***

TIGERSOFTWARE To Order: **1-800-888-4437** Int'l Orders: 305-443-8212 Fax: 305-444-50 ...ING

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Your Own Personal Weather Center...

AccuWeather Brings You Weather Updates and Forecasts Via Modem!

You can't change the weather, but you can get timely forecasts and radar screens to see exactly what it's doing with new AccuWeather.

With AccuWeather, your PC becomes a personal meteorological information service, providing data for the nation and the world. Using your modem, you'll access the same information that radio and television stations use to prepare their broadcasts. The screens you'll see are used by weather professionals who depend on precise, up-to-the-minute information that only AccuWeather can give. And now you can have a direct line to this same information.

AccuWeather features colorful, detailed screens like the ones on this page. The color-enhanced maps display current precipitation, temperatures, moving fronts, cloud cover, lightning, complete hurricane tracking sequences, jet stream movement, freezing levels, even soil temperatures and surf conditions. AccuWeather is fast and easy to use, employing simple menu commands.

Plan Business Trips and Vacations.

Need to know if this Saturday is a good day for a picnic? How about the business trip to the west coast? Or will next week be cold enough to go skating? AccuWeather provides detailed forecasts in advance and, unlike your local TV or radio station, you'll have time to research many different aspects of the coming weather, not just a general overview.

As Much Detail As You Want!

What's the weather like in Paris, Tokyo, Rome, Sydney, or Moscow? A menu selection displays complete information in seconds. Need highway reports, marine or aviation conditions? AccuWeather provides fast, accurate forecasts including freezing levels and off-shore data. AccuWeather also includes agricultural outlooks and extensive climate statistics for any region.

Print Maps and Screens.

AccuWeather allows you to easily print the maps and radar shots that are displayed on your PC screen. In the event of a hurricane in your area, printing AccuWeather's hurricane tracking maps can produce a complete history of the storm's movement.

THE SOFTWARE TOOLWORKS

ACCUWEATHER

BAE3003 **AccuWeather** Dual $49.95
IBM PC, XT, AT. Requires modem.

Stunning Fonts For Your Printed Page.

High Quality Scalable Fonts

Don't just print plain text — fashion creative works of art that bond themselves to the reader. Impress upon the printed page aesthetic, stunning communications that magnetically draw readers to them. This is what professional "Desktop Publishing" is all about. This is what Publisher's Powerpak can do for your word processor.

You absolutely must have Freedom of Font Choice. Whether you print on a dot-matrix, inkjet or LaserJet-compatible printer, Publisher's Powerpak delivers the finest-quality fonts your money can buy.

Why Scalable?

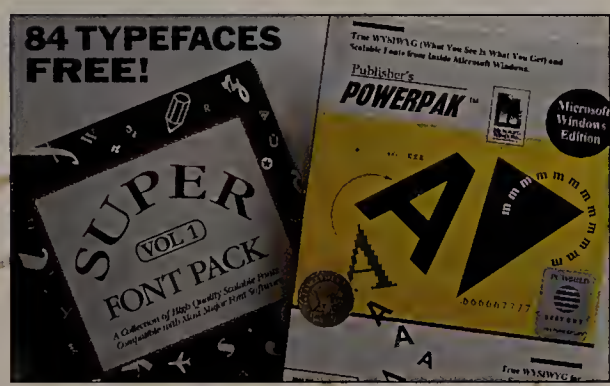
Publisher's Powerpak uses advanced scalable-font technology. When you need a font, you pick a size, and the needed letters are created instantly. The letters are scaled "on the fly" — as you need them. Scalable fonts use virtually no hard disk space — only 50K for an entire typeface family, which includes every size you'll want.

I used to use old-technology fonts (before the new scalable fonts came out). I had only 7 different typefaces. Each typeface had five sizes: 12, 14, 18, 24 and 36 point. My limited selection of fonts took up 10 megabytes of hard disk space!

Now I use Publisher's Powerpak. I have over 114 different typefaces to choose from. In any size I want, from 4 to 1,000 points (Word and Works limits point size to 127). With this seemingly unlimited selection of font choices, I actually use only 1⅓ megabytes on my hard disk. If I wanted this selection with my bit-mapped fonts, I'd have to buy a 200 megabyte hard disk!

Quality Fonts

Not all fonts are created equal. There are cheapies out there that print jagged letters and have strange character-spacing. That's why you want to stay with the choice of the pros. PC World recently declared Publisher's Powerpak the "Best Buy" of font software, and gave Powerpak's printer and screen fonts the highest quality rating — Excellent.



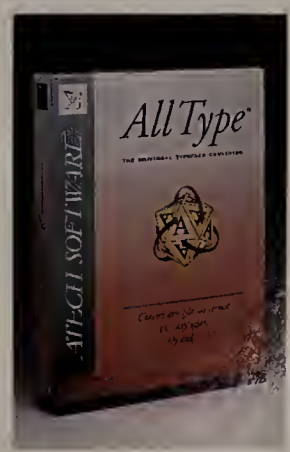
Super Font Pack, Volume 1 FREE — with every Publisher's Powerpak! A $150.00 value — FREE! 84 typefaces in normal, bold, italic, bold italic, thin, condensed, wide, expanded, and hollow.

Add-on Font Packs

Publisher's Powerpak includes 30 typefaces for an outstanding font-value. (Other font-makers charge $100 to $200 per typeface!) But that's just the beginning. There's an entire library of over 800 typefaces available for you to choose from. Plus foreign languages from Greek to Hebrew to Korean. When you're ready to add to your library, Atech font packs are filled with beautiful assortments of typefaces — two per pack for only $29.95 per package.

NEW! Convert and Use Any Font

If you have fonts, you'll love this new technological breakthrough. Now you can convert any font to any other font format! I changed all my Adobe PostScript fonts to Publisher's Powerpak fonts. When TrueType fonts arrive with Windows 3.1, I'll convert all those fonts too. Imagine — all your numerous types of fonts, all in one place under one font manager. With Atech's AllType, you can convert to and from all these font formats: **Adobe PostScript Type 1, Adobe PostScript Type 3, Atech Fast Fonts, Microsoft TrueType, Agfa Intellifont, GeoWorks Ensemble, DTC Nimbus Q, CorelDRAW!** and from Bitstream, **Fontware.**



It's so simple to install and use, and you can rename fonts in the process. Don't be fooled — this is high-quality stuff. AllType even converts "hinting" information, which changes spacing and other characteristics for certain font sizes. (Very important for small fonts.) You can create variations like bold, compressed, expanded, hollow and thousands of other variations all from your original typefaces.

PUBLISHER'S POWERPAK

BAE4095-3 **Powerpak for WordPerfect** 3½" .. $69.95
BAE4095-5 **Powerpak for WordPerfect** 5¼" .. $69.95
BAE5330 **Powerpak for Windows** Dual $69.95
BAE4094 **AllType** Dual $79.00
Requires hard disk.

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Circle 259 on reader service card

Convert FormTool Forms Into Graphic Forms.

Create Brilliant, Fully-Graphical Forms on Your PC.

Now, you can put this powerful, easy-to-use program to work for you for just $99.00!

FT/Pro is the fully graphical environment that remains true to the concept of fast, efficient forms design. Easy to use as the Macintosh, with a graceful Windows-like graphical interface, FT/Pro is at home on any 286 (or 386) based machine. It's from the development team that pioneered the F3 Forms Automation System. With over 5 years of research and development, F3's Pro Designer is currently the standard for hundreds of Fortune 500 corporations as well as many of the leading forms manufacturers.

The F3 Forms Automation System will change the way corporations manage their information, combining paper forms and electronic forms for maximum efficiency. Now, a piece of this technology is available for you to create the highest quality forms, with easy-to-access creative functions.

We've taken the superb drawing capabilities found in our advanced F3 Forms Automation System and adapted them for desktop use. Engineered specifically for forms design, FT/Pro goes far beyond the capabilities of traditional "desktop publishing" forms packages. It relies on volumes of built-in knowledge about forms standards and specialized design techniques combined with unparalleled drawing power.

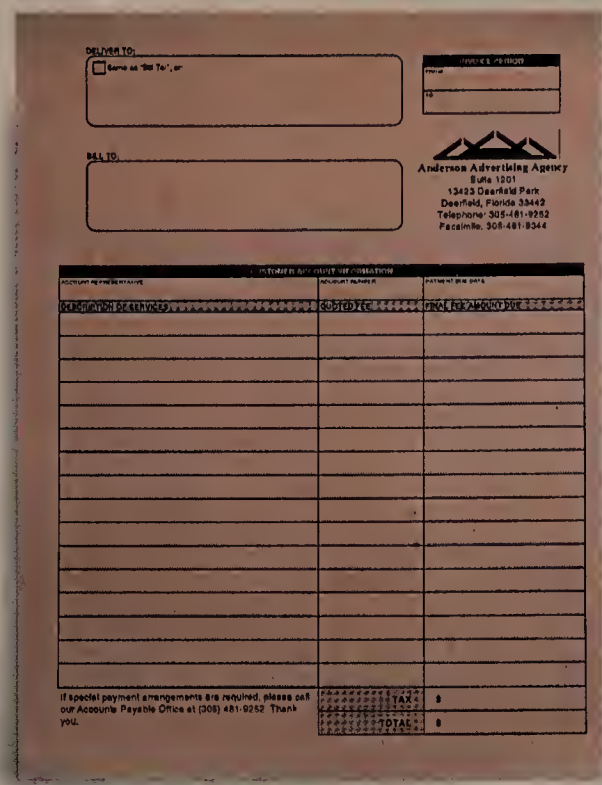
And it's all very easy to use.

The Highest Possible Quality Laser Forms.

New FT/Pro allows you more creative tools to enhance your forms and print them with more style and professionalism than any other forms package.

Easily Add Logos, Graphic Images!

This form contains a logo and specific typeface, point size and leading. It's high-quality forms design



made surprisingly simple, with more flexibility and creative options than with any other system. Your forms can be printed on your desktop laser or created as camera-ready art for "quick print" forms.

The grid in the background of this screen acts as a reference as you move through the form. FT/Pro is not desktop publishing. It is a system of forms-oriented drawing tools backed by built-in knowledge of proper forms design techniques.

Change Sizes, Colors, Typeface.

With one menu selection you can zoom in to any specific area on the form with the unique "zoom selector." Fast and easy, this method of detailing produces brilliant results with minimal effort.

Change ink and paper colors with a click and zoom in for an even closer look. FT/Pro does everything you've always wished FormTool or any other forms product could do. And more.

Instantly Converts FormTool Forms.

FT/Pro allows you to protect the investment you've made in FormTool because it automatically imports and converts your text-based FormTool forms to full graphics forms in just seconds! Converted forms can be enhanced as you view FT/Pro's true WYSIWYG display including fonts, colors, graduated screens, tints, logos and special effects.

Your FT/Pro forms can contain an unlimited number of fields per page, and up to 32 pages in a single form — including front and back. Dress up your invoices, purchase orders, checks and other forms that are presented outside of your office. Your FT/Pro forms will work as hard as your existing forms, but will bring a new level of quality and authority to all of your forms. Of course, FT/Pro allows you to easily create new forms from scratch.

FT/Pro

BAE1023-3 **FT/Pro** 3½" **$99.00**
BAE1023-5 **FT/Pro** 5¼" **$99.00**

Supports 286 and 386-based IBM or compatible computers. Requires 640K RAM; supports EGA and VGA displays. Complete mouse support (although mouse is optional). PostScript, Hewlett-Packard LaserJet laser printers (1.5 megabytes printer memory required).

World's Highest Quality, 256-Gray Scale Hand Scanner!

Logitech brings you the ultimate in scanned-image clarity and detail...

We've gotten used to the limitations of scanned images. We're not surprised when a scanner produces an image that's not bad — but not great, either. We sort of expect low-quality. Which is why the ScanMan 256 from Logitech blew the lid off of our lab the first time we slid its ergonomic case over any kind of photo!

This incredible new instrument is utterly amazing, capable of professional-quality scans for photos, detailed line art, monochromatic images and more. It delivers 256 levels of gray — not just 64, or 16 — but 256 individual levels for ultra high quality. They're bright, crisp, clean, highly detailed and require no touch up whatsoever.

Superior image construction and unmatched clarity makes editing and manipulating your scans simple and precise. The secret is the innovative new red scanning beam. It produces 7 times more light (the critical factor in capturing minute detail and sharp contrast) than other scanning light colors.

And the ScanMan 256 is built like no other scanner we've seen. It's heavier, making straight-line scanning easy. It's balanced, so you can move at a consistent speed for the best possible reproduction. And only the ScanMan 256's Image Memory Manager swaps image data between your RAM and hard disk, so you can quickly work with even the most memory-intensive images.

The Scan Itself...

With most scanners, the act of moving across the image is less than scientific. Move too slow, you get muddiness, move too fast and you lose detail. If you don't scan in a perfectly straight line, the lovely young lady in your photo scans like something out of a Picasso painting. The ScanMan 256 eliminates the guesswork. The ScanMan 256 features a scanning speed indicator. Turn it on and it's green and ready to go, begin scanning a little too quickly the light turns yellow, then red if you're moving too fast to capture the image properly.

Scanning For Desktop Publishing

Using the ScanMan 256, you not only get great scanned images, you can do all kinds of very creative things with them, like create magazine-quality halftones, lighten or darken your images, adjust the contrast, reverse them, resize them, make line art out of photos and more.

The ScanMan 256 includes FotoTouch,™ an easy-to-use image editing software system that allows quick retouching, speedy zooms, great special effects and a host of image-manipulation features. FotoTouch is one of the most sophisticated packages we've seen, and a must even as a standalone package, but it's included FREE when you buy the amazing ScanMan 256.

Clean OCR Scans...

Here's where the advanced technology of the ScanMan 256 shows what else it can do. If you use OCR (optical character recognition) software to scan text, you know the "clean-up" factor you're faced with. The ScanMan 256 outperformed all other contenders in our OCR testing using a page of 11 point, Century Schoolbook type with 12 points of lead. It produced usable text with fewer errors, scanning faster than any other hand or full-page scanner.

The ScanMan 256 is a complete system, compatible with all leading desktop publishers and fully guaranteed by Logitech.

Also Available:

The Cordless Mouse!

The MouseMan is a cordless, three-button, radio-controlled mouse! No cables, no line-of-sight positioning! The radio receiver can be placed anywhere — even under your desk — and still allows you to work with precise movement. It's fully Microsoft compatible and includes Mouse-2-3, designed for maximum Lotus 1-2-3 productivity. It is the most advanced pointing device on earth, with a slew of built-in Mouseware utilities.

LOGITECH

LOGITECH

BAE2594 **ScanMan 256** w/FotoTouch **$299.00**
BAE2595 **MouseMan Cordless Mouse** **$99.00**

ScanMan: *PC with 286, 386 (386 SX or 386 DX) or higher processor; MS- or PC-DOS 3.1 or higher; Microsoft Windows 3 or higher; 640K conventional and 256K extended memory (1 MB RAM); one floppy disk drive and a hard disk; CGA, EGA, VGA, 8514/A (SuperVGA) or Hercules graphic card, or compatible video graphics adaptor and appropriate monitor (VGA or higher graphic adaptor recommended for gray scale display).*

T ... **rder: 1-800-888-4437** Int'l Orders: 305-443-8212 Fax: 305-444-5010 **FREE** FEDERAL EXPRESS **SHIPPING**

Circle 259 on reader service card

The Fastest, Easiest Way To Learn Windows 3.0!

The Most Advanced Windows 3.0 Teaching Method Available!

As with any new task, "visualizing" teaches you far more than just reading about it. And although Windows was built on the concept of ease of use through its interface, some aspects of Windows may be new and perhaps a little intimidating for first-time users.

WIND•EASE is the innovative software tutorial that allows you to forego the lengthy manuals and get right to work. Real drop-down menus and application menus provide dramatic insights into the power and beauty of Windows 3.0.

Sophisticated in presentation, it facilitates in-depth understanding by matching Windows' commands, visual displays, and dialog boxes to clear, concise explanations.

Perfect For Beginners and Intermediate Users.

WIND•EASE gives you a thorough understanding of Windows 3.0. If you're new to the environment, you'll quickly grasp the rudiments and progress quickly through its many advanced features. If you're a current Windows 3.0 user, you'll find loads of information on features you may never have used before. It's also fun to use WIND•EASE. With WIND•EASE, learning Windows is enjoyable and so will be using it.

More In-Depth Than Even The User's Guide.

As you quickly learn Windows you'll discover WIND•EASE actually takes you beyond the user's guide. Here, you'll learn how to install and use other applications, how to quickly and easily set up networks, printer and fonts, how to create time-saving macros, how to customize PIFs, and use MS-DOS Executive. There's dozens of tips and techniques for using Windows 3.0 to its fullest.

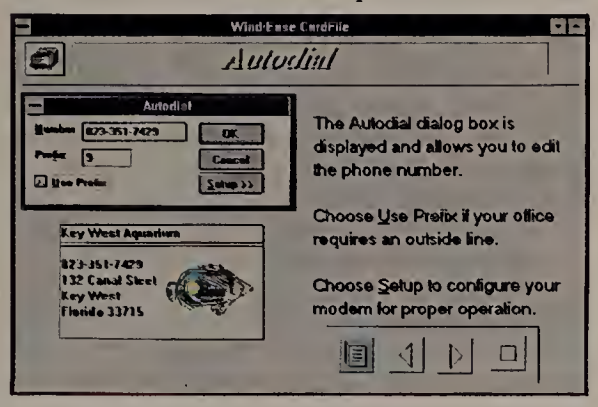
WIND•EASE is a rich graphical program with *18 distinct program-segments*, designed to isolate and teach you window concepts.

The unique and easy installer *allows you to choose the segments you wish to install.*

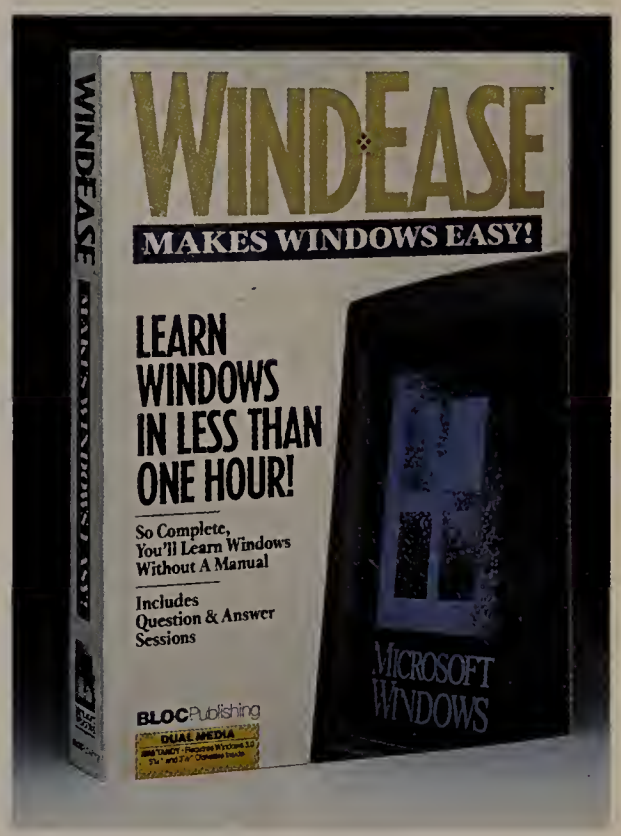
- Basics (for beginners)
- Program Manager
- File Manager
- Print Manager
- Write
- Terminal
- Paintbrush
- Clipboard
- Control Panel
- Setup
- PIF Editor
- MS-DOS Executive
- Notepad
- Calendar
- Calculator
- Recorder
- Clock
- Cardfile

The program is structured for ease of use and thoroughness. *Consequently, it is ideally suited for corporate training programs*, at home/office users, and even first time Windows users. And, because WIND•EASE runs under Windows, it's always there if you need instantaneous assistance!

WIND•EASE includes a question and answer exercise at the end of each segment, designed to reinforce, clarify and offer additional insights into the material presented.



Quick & Easy. Put names and addresses in the Card File. Then Dial your telephone directly from Windows. WIND•EASE shows you how.



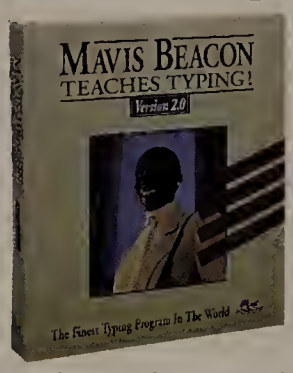
WIND•EASE

BAE5070 **WIND•EASE** 5¼" & 3½" $59.95

Microsoft Windows 3.0, 286 or higher processor, 640K plus 1MG extended or expanded memory, hard drive, VGA monitor, mouse.

Learn to Type with the Finest Typing Program in the World!

So fast and easy — you'll be touch typing with speed and accuracy in just a few short lessons! Mavis Beacon Teaches Typing! is the premiere touch-typing self-help program that uses carefully planned lessons and drills — perfect for beginners, or typists who want to improve their speed and accuracy.



NEW! Version 2.0.

Mavis Beacon Teaches Typing! has been the world's leading computer typing instruction program for several years. With new graphics support, a 10-Key Teaching Mode, improved lessons and numerous other new features, the world's premiere typing instruction program just got better. And, Mavis Beacon is now available in a new Microsoft Windows version.

In addition to supporting CGA, Hercules and text modes, Mavis V2.0 now features EGA/VGA 16-color, 320×200 graphics plus Custom Color Palette. And the new 10-Key Teaching Mode will help users master the numeric keypad.

Type Faster and More Accurately.

Four different "learning centers" provide an entertaining, informative experience. The new Frustration Sensor helps Mavis Beacon to pace beginning typists, avoiding early discouragement.

First, Mavis Beacon Teaches Typing! outlines the lesson plan and evaluates your typing for speed, accuracy or particular problems. From there, each lesson is custom designed to work on these problems. If your speed is poor, Mavis Beacon will prescribe drills for increasing speed. If accuracy is your weakness, Mavis will help you work on the problem keystrokes.

Ideal for Classrooms...

A new Teaching Mode & Classroom Network Feature makes it easier to teach and to link students together. Plus, Mavis Beacon Teaches Typing! allows teachers to track students' progress, administer uniform tests and perform trend analysis.

NOW AVAILABLE FOR WINDOWS!

SAVE $10.00

THE SOFTWARE TOOLWORKS

Mavis Beacon Teaches Typing!

BAE4705D **Mavis Beacon PC** 5¼" & 3½" $39.95

BAE4705W **Mavis Beacon Windows** $49.95

IBM PC, XT, AT, PS/2, compatibles with 256K.

Over 1,000 Windows Icons.

Have some Windows kind of fun with custom icons and cursors. Now anyone can change Windows icons any way they like. And not only icons, but the cursor too. Select a professionally designed icon or cursor from a huge library, or custom create your own.

For the action-minded, turn any icon into an animated mini-movie! Fill your Windows screen with animated icons while you continue to work. It's something you have to experience to believe. And if that doesn't satisfy your craving, you can even animate your cursor. That's right! Turn your cursor into a whirling tornado or a break-dancing Gumby!

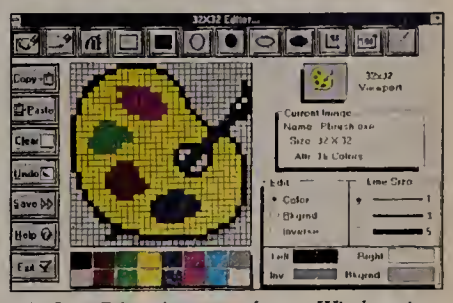
The World's Easiest — ICON DO-IT.

Icon Do-It adds a new menu selection to your Windows Program Manager. You can't miss it – it's the one with the rabbit. Click it to open the world's fastest and easiest way to change icons and cursors. Two clicks later and you've replaced your dull, gray icon with a lively, colorful icon.

ICONTAMER PROFESSIONAL.

Not only do you get a collection of over 1000 icons, you also get the ability to make these icons into tiny animated sequences that play over and over on your desktop. Bring in any icon from any program and create animated sequences for them. IconTamer Pro is the only system that doesn't restrict you to use only single-icons, cursors or icon library files. So any icon can come to life.

PC Magazine says that "IconTamer is a complete icon management program allowing you to re-name, edit, delete, capture icons from the desktop, and convert .BMP files into icons. This program is a must for icon fanatics..."



The Icon Editor lets you take any Windows icon and change it — or paint a new one.

Also from Moon Valley, CASINO PAK I.

Turn Windows into Caesars Palace with Las Vegas style gambling! Blackjack, Poker and Keno add up to hours and hours of pure entertainment.

FREE WIND•EASE
When You Buy IconTamer Pro!

MOON VALLEY

BAE3884-5 **IconTamer Pro** 5¼" $69.95
BAE3884-3 **IconTamer Pro** 3½" $69.95
BAE3885-5 **Icon Do-It** 5¼" ... $29.95
BAE3885-3 **Icon Do-It** 3½" ... $29.95
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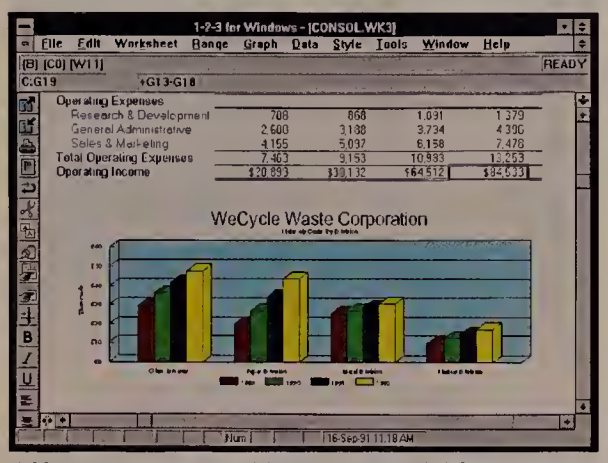
Lotus 1-2-3 for Windows! The Upgrade is Here! Just $99!

It's here.

TigerSoftware is proud to be one of the first in the world to roll-out the product that will change the face of the software market once again. Our relationship with Lotus Development Corporation allows us to offer this incredible breakthrough product to our customers for just $99. That's not a typo! Buy Lotus 1-2-3 for Windows for just $99. And, of course, it's the full upgrade package.

One of the most important titles in the industry, Lotus 1-2-3, now brings the magic and power of the spreadsheet to the Windows platform. The ultimate graphical spreadsheet. Lotus 1-2-3 has been the top-selling business software system in the industry for hundreds of weeks in a row. It virtually changed the software scene and now, with the introduction of the Windows version, it opens a new world of possibilities to make your spreadsheets not only easier to create, but more interesting to look at, as well.



Add a chart to your spreadsheet in just 2 clicks! Click again and change from 3D Bar or Pie, or select from numerous chart types. And Drawing tools let you call attention to special areas and customize your work.

Lotus 1-2-3 for Windows contains the genius of SmartIcons. These icons, like those featured in Ami Pro, exploit the visual nature of the graphical user interface like no other concept in computing. Just click on one and save dozens of keystrokes. Cut, paste, save, print, format and more with just one move. Like macros, SmartIcons can save hours of manual input as you prepare your spreadsheets.

1-2-3 for Windows allows you to create printed spreadsheets that blast off the page with a host of incredible tools. Fully PostScript compatible, 1-2-3 for Windows gives you complete control of text, data, graphs, styles, colors and more.

1-2-3 RELEASE 2.3 FOR DOS

This is the latest release of the traditional 1-2-3 spreadsheet product that captured the imaginations of millions of users. Lotus 1-2-3 Release 2.3 is the fast, powerful and graphical spreadsheet for DOS. It's faster, easier, more powerful. It runs just as beautifully on an older XT with as little as 512K of memory as it does on the newest 486 machine. Which means that you can have all the hot new Lotus features without running out to upgrade your system.

1-2-3 RELEASE 3.1 PLUS

Lotus 1-2-3 Release 3.1 Plus includes a fully interactive WYSIWYG environment combined with advanced Impress technology to produce a new graphical way of using the familiar (and proven) 1-2-3. There's complete mouse support for quick and easy selection of menu commands, range selection, row heights and column widths. The live, on-screen formatting gives you the ability to enhance your spreadsheet with an array of great built-in tools like Bitstream fonts, shading, colors and much more. No other spreadsheet product delivers the on-screen flexibility of 1-2-3 Release 3.1 Plus.

FREELANCE GRAPHICS 4.0 FOR DOS

When you're ready to put together the presentation of your career, complete with slides, overheads and handouts that bring the house down, seek the help of the hottest business graphics program available for DOS — Freelance Graphics. Now in its fourth release, Freelance Graphics has won every major industry honor, from the major publications like PC Week, PC World, and Publish!. Freelance Graphics offers all of the fundamental graphic capabilities and adds a magnificent array of tools and unique "Smart Features" that represent the best way to assemble a "knock their socks off" presentation.

FREELANCE GRAPHICS FOR WINDOWS

For Windows users, the power and beauty of Freelance Graphics explodes with an incredible assortment of graphics tools based on the DOS version, but taken to a new level of visual excitement.

LOTUS UPGRADES

BAE5195 Lotus 1-2-3 Windows	$495.00
BAE5197 Lotus 1-2-3 Windows Upgrade	$99.00
BAE5179 Lotus 1-2-3 Release 2.3	$365.00
BAE5093 Lotus 1-2-3 Release 2.3 Upgrade	$99.00
BAE5178 Lotus 1-2-3 Release 3.1 Plus	$425.00
BAE5192 Lotus 1-2-3 Release 3.1 Plus Upgrade	$99.00
BAE5177 Lotus Magellan	$95.00
BAE5181 Lotus Magellen Upgrade	$79.00
BAE5176 Lotus Agenda 2.0	$315.00
BAE5085 Lotus Agenda 2.0 Upgrade	$99.00
BAE5175 Freelance DOS	$355.00
BAE5196 Freelance DOS Upgrade	$99.00
BAE5174 Freelance 4.0 Windows	$355.00
BAE5198 Freelance 4.0 Windows Upgrade	$99.00

Restrictions apply. Call Tiger for details.

The Ami Pro Upgrade: $99.95!

The Number-One Rated Windows Word Processor. Easier, Faster, More Creative.

Ami Pro has created a world of possibilities for the printed page. It is a pure Windows product, not a "ported" DOS counterpart. It features the visual power and easy-to-use nature of Windows 3.0 to produce top-notch results. Indeed, it established a new standard in word processing for the graphical user interface.

Now, version 2.0 breaks new ground with a rich visual environment along with an amazing array of easy-to-use tools at your fingertips. You'll write and format sophisticated documents you may have never attempted before because Ami Pro 2.0 is designed to work like you do, associating pictures and symbols — with concepts. Your ideas take shape faster and expressing them becomes easier.

That's the key: Ami Pro 2.0 is extremely easy to use. So easy to use in fact, that you can create crisp, professional-looking letters, reports, proposals and presentations the very first time you use it — even if you've never used a word processor before!

An Ideal Writing Environment. Fast, Smart — and Visual.

Ami Pro 2.0 features fast outlining, easy revision marking, mathematical equations and even freehand drawing. You'll put together charts and tables with simple point-and-shoot action. You'll see your work with true WYSIWYG display.

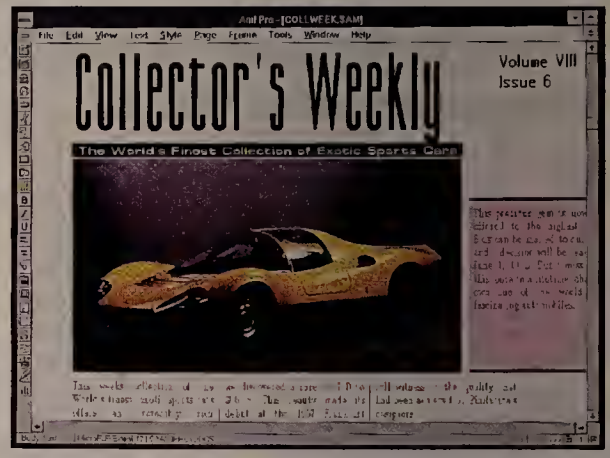
You'll enjoy the built-in portfolio of style sheets and graphics-manipulation tools. Simply choose from pull-down menus to generate a table of contents, flow text around graphics, change fonts, colors and more. You'll select typefaces and move elements on the page easier than you ever thought possible.

Ami Pro 2.0 gives you the best spell checker in the business, a thesaurus with 1.4 million selections, a full macro language, interactive ruler, status bar, color palette and more. More than Word For Windows. More than WordPerfect.

Power Under the Hood!

Although Ami Pro 2.0 is a breeze to use (and use to its fullest), it posesses enormous power under its sleek interface. You'll seamlessly import and export files from WordPerfect, Microsoft Word, MultiMate, DCA, DisplayWrite, WordStar and others. Ami Pro 2.0 contains over 120 one-click customizable SmartIcons (matching those found in Lotus 1-2-3 for Windows) which make moving through Ami Pro 2.0 fun.

Ami Pro 2.0 features a unique dialog box that shows you What-You-See-Before-You-Get-It right on the screen. Open and edit multiple documents at one time, see them in four editable view levels — all WYSIWYG and instantly "hot-link" to other Windows applications.



The ultimate word processor — complete with easy-to-use desktop publishing tools for stunning newsletters, reports and more. Perfect for everything from a short memo to a comprehensive book.

Why Run Windows 3.0 If You Don't Make Use of Its Power!

Whether you're an executive who types only occasionally, or a heavy user who demands a long list of specialized features, you'll achieve impressive results with Windows 3.0 and Ami Pro 2.0.

EXCLUSIVE TIGER PACK

AMI PRO *PLUS* WINDOWS 3.0 *AND* THE LOGITECH MOUSE

ALL 3 JUST $169.95!

AMI PRO 2.0

BAE5291D Ami Pro Upgrade	$99.95
BAE5090 Ami Pro	$302.95
BAE5095 Tiger Pack: Ami Pro *Competitive Upg.*, Logitech Mouse & Microsoft Windows 3.0	$169.95
BAE5097 Ami Pro & Logitech Cordless Mouse	$199.00

Requires Windows 3.0 & 640K

Sorry, free shipping is not included on this special offer.

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The Marstek Line of Precision Scanning Instruments

Black & white, grayscale, color, hand scanners, full-page scanners — there's a Marstek scanner to fit every purpose. Choose the one that's right for you from this exciting lineup of quality scanners.

256-GRAYSCALE HAND SCANNER

The Marstek M-800G/256-grayscale handscanner's unmatched technology delivers the crispest, cleanest images from any original. This is a professional scanning and imaging package, unlike anything else available today, allowing you to capture anything on your screen by simply passing the scanner over it! And its OCR (optical character recognition) software allows you to scan text from anywhere. Just pass the scanner over it and use it in any application — without re-keying.

Perfect for desktop publishing applications, as well as the new breed of Windows word processors, the Marstek M-800G is extremely flexible, featuring advanced "yellow/green" scanning lights to capture the finest details — even from originals the size of a postage stamp! And the M-800G's special Inverse Scanning capability creates many special effects.

Imagine an instrument that you can quickly pass over a graphic image, logo, design, drawing, chart, photograph — and instantly capture it to your computer screen — in ultra sharp 800 dots per inch resolution! That's what you can do with the 800 handscanner. 800 dpi means crisper, cleaner, more highly detailed images for use in desktop published documents, reports, newsletters, and brochures.

And with a host of special effects and 12 halftone patterns built right in, controlling the look of the image is simple! The images you scan will reproduce as if they were originals, and they can be stored in TIF, PIX, PCX, CUT, IMG and MSP formats.

SUPER COLOR SCANNER

The new M-6000CG Super Color scanner absorbs an astonishing 262,144 different colors from any printed page or photo! Scan in your photo albums, wedding picture, or graduation photo and display it onscreen with lifelike realism. Produce high-impact documents and presentations with the power of graphic images. The possibilities are limitless.

NEW! FULL-PAGE COLOR SCANNER!

The latest addition to the Marstek line of professional scanners is a full-page, flatbed color scanner. This top-of-the-line, wonder-machine scans in an astounding 16 million colors (24-bit) with a copier-like, flatbed top. Perfect for scanning from a book - you don't need to tear out the page. Delivering a crisp 300 or 600 dpi, this scanner is a must for true-color, full-page applications. This color scanner comes bundled with Picture Publisher, the best Windows application for perfect scans and absolute image control.

B O N U S !

FREE with the Marstek Full-Page Color Scanner: Picture Publisher

Here's the toolbox of highly advanced, simple-to-use software products for Windows that allows you complete control over your scanned images — including painting, gray scale, image processing, OCR (Optical Character Recognition) and RTV (Rastor To Vector) conversions.

AND Perceive Personal — Powerful OCR Software...

Perceive Personal now brings advanced, full page OCR (Optical Character Recognition) to PC/AT compatible hand scanners. It combines the power of true "omnifont" (any font, any size) OCR with the convenience of full-page text recognition in the powerful Microsoft® Windows environment.

Marstek

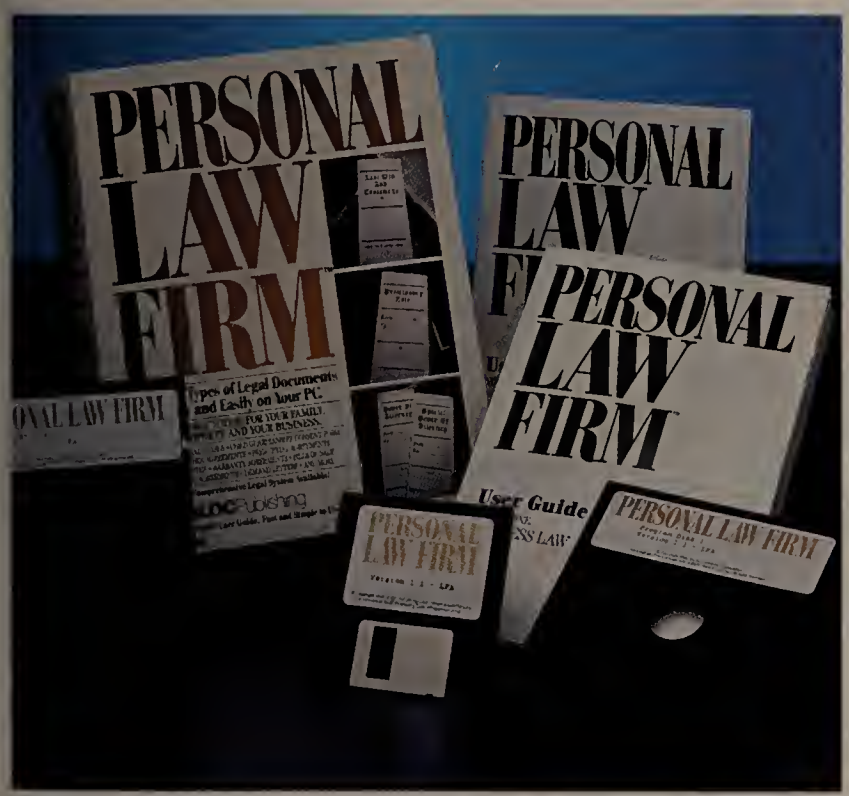
MARSTEK

BAE6130	M-800 Halftone scanner w/Perceive OCR and PC Paintbrush Plus	$279.00
BAE6180	M-800WP Halftone scanner w/Image-In and Perceive (Windows)	$399.00
BAE6205	M-800GW 256 grayscale w/Image-In (Windows)	$349.00
BAE6200	M-800GW+ 256 grayscale w/Image-In and Perceive (Windows)	$399.00
BAE6210	M-8000G+ 256 grayscale w/Rainbow Paint (DOS)	$349.00
BAE6170	Mac 800 Scanner for Macintosh w/Enhance	$399.00
BAE6215	M-6000CG Color Scanner w/Perceive OCR and Picture Publisher (Specify Windows or DOS)	$599.00
BAE6225	Full-Page 300 dpi Flatbed Scanner w/Picture Publisher and Perceive	$1295.00
BAE6230	Full-Page 600 dpi Flatbed Scanner w/Picture Publisher and Perceive (Windows)	$1695.00

Prepare Your Own Will — Now!

Binding Legal Documents To Protect Your Family, Business and Property.

By simply typing answers to questions on your screen, Personal Law Firm actually "writes" binding legal documents customized to your specific situation and ready to sign. From wills to maintenance agreements; work for hire agreements to warranty documents; promissory notes and commercial leases to demand letters, Personal Law Firm gets it in writing fast.



With over 500 pages of concise, informative documentation and reference, Personal Law Firm is the most comprehensive legal package available today. Just select the type of document from the Main Menu. There's plenty of background material on each document you prepare, along with explanations of the applicable laws that govern them.

The Importance Of A Will.

It's a nightmare you hope never happens. An untimely accident or illness leaves your family without a breadwinner — and without a will. In such cases, the state immediately moves in to divide your estate as it sees fit, with no regard for your wishes. Your survivors will face a long, uphill battle to reclaim what a will would have granted them instantly upon your death.

Yet, 3 out of 4 people every year die without one.

Perhaps you feel that in the event of an illness or accident that leaves you completely dependent on life support, it should not be prolonged. You can create a Living Will to state in writing your wishes under specific circumstances.

Personal Law Firm covers virtually any everyday personal or business legal situation. For example, a restaurant owner from Chicago recently wrote us to relate this situation: A customer raved about his family recipe "Sauce Katrina" served at his restaurant, and asked for the recipe. Several months later, the restaurant's chef ran across "Sauce Katrina" bottled and for sale at the local epicurian shop with a label bearing the exact ingredients and the customer's name. A demand letter went out the next day from the restaurant owner to the customer asking sales of the sauce be stopped. The customer agreed. With no legal fees and no further misunderstanding.

Or what happens in a situation where your pool man accidently damages your pump and refuses to pay for the repairs? A written Maintenance Agreement clearly handles such occurrences.

If It Isn't In Writing...

...It simply isn't binding. And it's never easy to predict where you'll run into a legal situation that can get out of control. To protect yourself against these unforeseen problems, you must get all agreements you enter into *in writing*. Personal Law Firm is the fastest, most inexpensive way to provide that protection.

Personal Law Firm Includes:

- Last Will and Testament
- Living Will
- Residential Lease
- Power of Attorney
- Living Together Agreements
- Prenuptial Agreements
- Postnuptial Agreements
- Marital Settlement Agreements
- Child Guardianship Consent Form
- Commercial Real Estate Lease
- Work for Hire Agreement
- Maintenance Agreement
- Personal Guarantee
- Release of Lien
- Promissory Note
- Trade Secret Protection
- License of Intellectual Property
- Assignment of Intellectual Property
- Bill of Sale
- Warranty Agreement
- Software Escrow Agreement
- Letter of Offer to Purchase
- Demand Letter
- Rejection of Goods Letter
- Termination of Contract
- Notice of Contract Breach
- Notice of Contract Assgn.

Personal Law Firm

BAE1050 **Law Firm** 5¼" & 3½" $99.95

IBM PC, XT, AT, PS/2 and compatibles with 256K, one floppy, a hard disk and DOS 2.1 or greater. It requires an 80-character display (color or monochrome) and will support virtually any printer.

TIGERSOFTWARE To Order: **1-800-888-4437** Int'l Orders: 305-443-8212 Fax: 305-444-5010 ***FREE*** FEDERAL EXPRESS ***SHIPPING***

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NEW! Daily Number Buster 2.0!

The Most Advanced Daily 3-And-4-Number Software Available!

From the makers of the smash hit The Complete Lottery Tracker and Wheeler comes the winningest DAILY number program available today. The Daily Number Buster will increase your chances of winning 3 and 4 digit daily number games and all daily deal games (California's "Decco" and Ohio's "Cards" and others). It's fast, fun and completely menu driven, so it's ready to go right out of the box.

This new version has been completely redesigned, with dozens of new screens and features to help you play these games with the odds on your side! You can store hundreds of Pick 3 and Pick 4 numbers and dates, and The Daily Number Buster allows you to print detailed reports and charts of game statistics, recorded numbers and position hits. These reports become the basis of future picks and daily strategies. And Daily Number Buster makes it easy to determine HOT, DUE and AVERAGE winning numbers!

Each 3 and 4 number game includes all straight and combination bets and unlimited number of BOXING bets. You also get a complete explanation of odds and a handy Odds Chart for instant reference. Start winning more of those lucrative daily games with the most comprehensive, easy to use software product of its kind — the all-new Daily Number Buster!

Lottery Tracker & Wheeler Version 4.0

The Complete Lottery Tracker & Wheeler has already been proven to increase your odds of winning by hundreds of times. It's an advantage that most states may not want you to have! And this all-new version includes dozens of innovative wheeling systems (some never before seen), streamlined new screens, more data analysis and a free database of your state's past winning numbers. The Complete Lottery Tracker and Wheeler's sleek, newly re-designed interface makes it easier to maximize payoff possibilities on any state or international lottery game — choosing from up to 80 numbers!

The Complete Lottery Tracker & Wheeler gives you the ability to track and play as many lotto games as you want, it provides the tools to produce charts, stats, reports and your own customized programs for the world's most popular number wheeling systems. Create trend charts, analyze past winning numbers, produce accurate statistics on frequency, recency, bell curves, percentages and "hot" or "due" winning numbers.

Designed by the Pros.

Lottery professionals and enthusiasts agree that The Complete Lottery Tracker & Wheeler is the one system powerful enough for the serious player. They play many state lotteries on a consistent basis, carefully tracking the results and formulating winning strategies.

FREE BONUS Audio Cassette! 'Lottery Winning Strategies' *Learn What The Big Winners Know!*

We're also very proud to introduce the all-new "Lottery Winning Strategies" audio cassette, containing new information, new strategies, new tips and techniques. It's FREE when you buy The Complete Lottery Tracker & Wheeler.

FREE BONUS!

Coupon for a Free "Winning Combinations" Database Inside Daily Number Buster and Complete Lottery Tracker & Wheeler

A history of winning numbers in your state! All US & Canada (Lottario) past winning numbers available.

LOTTERY SYSTEMS

BAE3615 **Daily Number Buster** 5¼" & 3½" . . **$49.95**
BAE3610 **Lottery Tracker & Wheeler** **$49.95**
IBM PC, XT, AT, PS/2 and compatibles. Requires 256K.

How Do You Fill In Pre-Printed Forms?

Eliminate One Of The Office's Most Time-Consuming, Tedious Tasks.

Are you still filling in insurance forms, legal and tax forms, government forms, invoices, medical and Federal Express forms by hand? Or struggling through the trial-and-error nightmare of using a typewriter? The fact is, filling in pre-printed forms is a classic example of inefficiency, with a high margin for error. The PC can be a great assistant in filling in forms, and FormFiller 3.0 is the premier forms fill-in software for even the most complex multi-page, multi-part, and double-sided forms.

FormFiller 3.0 actually synchronizes your computer printer (a critical first step), to locate blanks and place information on the form with pinpoint-precise accuracy, and it works with virtually any dot-matrix, daisywheel or laser printer. This powerful software streamlines data entry with a host of on-screen guides and error-checking features. These features not only speed the process, but virtually eliminate errors as well — errors that can be very costly. Along with FormFiller 3.0's extensive data validation features there's plenty of fully context-sensitive help available for any function.

Unmatched Math and Financial Functions.

The system doesn't stop there. It contains a complete set of financial and mathematical functions that you can easily assign to particular blanks to perform a specific calculation whenever value is entered. Or you can automatically perform a series of calculations on a series of numbers. For example, you could quickly instruct FormFiller 3.0 to calculate the extended prices of all items listed on an invoice, total them, deduct a discount, figure and deduct taxes and calculate the final total. There are over 40 math functions in all, including amortization, interest, present and future values, depreciation, percentages — dozens of others!

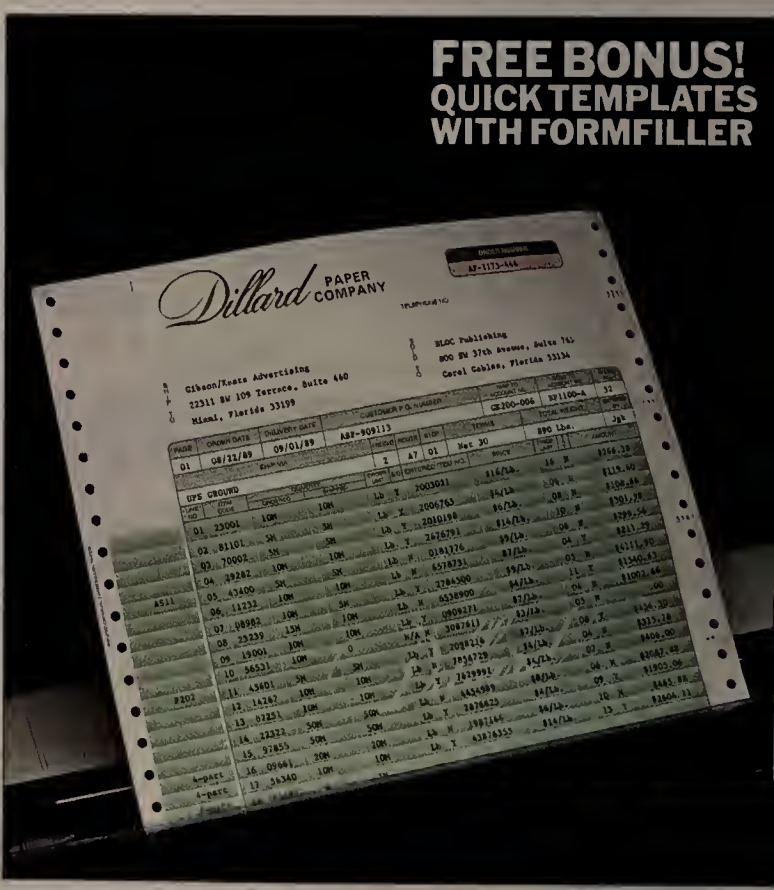
This all means that a form that may have taken fifteen or twenty minutes to fully complete (possibly containing errors), now may require as little as one minute to fully complete, including a check for errors and omissions. The form appearing on this page was filled in using FormFiller's advanced fill-in, Look-up feature and math capabilities in under one minute. Businesses of all sizes can use the ease and power of FormFiller 3.0 to make extremely light work of a difficult, awkward chore.

Slash Fill-in Time of Pre-Printed Forms.

FormFiller 3.0 can, in fact, slash the fill-in time required for any form by as much as 80 percent. By creating a "master template" of the form, FormFiller 3.0 can match any spacing, even if the spacing changes throughout the form or is inconsistent from line to line.

Data entry is as easy as tabbing from blank to blank, with so much of the tedious work removed from the process that filling in forms isn't the messy, time-consuming project it once was.

FormFiller 3.0 actually contains two distinct programs. Designer, which actually allows you to create templates to your exact requirements, and Filler, which can be used by data entry personnel to display the form, fill it in and print it.



It Took Just 2 Minutes To Fill-in This Form.

FORMFILLER 3.0

BAE1200 **FormFiller 3.0** 5¼" & 3½" **$129.95**
IBM PC, XT, AT, PS/2 or compatibles with 512K, DOS 2.0 or greater and one floppy drive and a hard disk. Supports virtually all printers. Includes "The FormFiller Sampler"— sample templates, user guide and help cards.

TIGERSOFTWARE To Order: **1-800-888-4437** Int'l Orders: 305-443-8212 Fax: 305-444-5010 **FREE** FEDERAL EXPRESS **SHIPPING**

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Three Indispensible Reference Titles!

WORLD ATLAS

This innovative program brings the entire globe to your computer screen, combining a complete atlas, almanac and world fact book into one exciting, informative package.

You'll have instant access to over 200 fully-detailed, VGA maps, ocean maps and useful international information on 270 topics in 11 categories. Explore the geography, people, government, and economy of any nation on Earth, including such details as climates, health, population, language, labor force, military strength, inflation, industry, highways and waterways, and more.

Maps like the one you see here are highly detailed and contain information on travel, climate, geography and population. Both World Atlas and USA Atlas give you a wealth of information.

Indispensible Reference Tool.

World Atlas is an ideal reference tool for travelers, educators, business people, librarians and students. It's an indispensible guide that brings together all types of important information that would take months to research and assemble.

New version 2.0 includes conversion tables for currency, weights and measures; city to city mileage indicators; and local time and date information (World Atlas is the only program that adjusts for daylight savings time!)

You can easily print customized reports mixing maps, graphs and text — even export maps to desktop publishing programs for use in your newsletters, reports and other publications.

Create Over 4,000 Statistical Maps.

Users can select from 10 categories containing approximately 300 data topics to create statistical maps at the world level or for any region. Data can be display using a Shaded Map (for comparative data) or Bar Map (for total amounts). There's also volumes of comparative data on every country in the world in five subject areas: geography, people, government, economy, trade, and communications.

NEW! U.S. ATLAS

U.S. Atlas brings the entire North American continent to your computer screen! Simply click on a state or city to explore such information as: population, average temperatures/precipitation, local time, area codes and zip codes. Everything you need to know will be displayed in easy to read windows. Even print reports with maps and text.

DESK REFERENCE

The electronic edition of the New York Public Library Desk Reference contains thousands of entries on everything from finances, philosophy, animals, sports, academy awards, major corporations, abbreviations, music and etiquette to religion, calorie consumption, nutrition, state names, cooking, symbols and signs, copyrights, consumer bureaus, bartending, poison control hotlines, card games and computer terms. But there's so much more! Industry, literature, the metric system, television, space travel, hard-to-find addresses and phone numbers, first aid and more — 26 major categories in all. It's interesting just browsing through topics at random.

TOOLWORKS

BAE3225 **World Atlas** 5¼" OR 3½"	**$59.95**
BAE3230 **Atlas Pack** (World & U.S.) 5¼" OR 3½"	**$79.95**
BAE3220 **U.S. Atlas** Dual	**$49.95**
BAE3240 **Desk Reference** Dual	**$49.95**
BAE5520 **World for Windows** 5¼" OR 3½"	**$69.95**
BAE5510 **USA for Windows** 5¼"	**$69.95**
BAE5530 **Desk Reference Windows** Dual	**$49.95**

Atlas: *IBM PC or compatibles with 640K. Hard disk; EGA or VGA graphics card color monitor; Microsoft mouse or compatible.* **Desk Reference:** *IBM PC or compatibles with 640K. DOS 3.1 or higher. Hard drive required.*

"My Mailing List Is A Goldmine!"

Manage Your Mail Lists — Simply!

Smart people are finding magic in their mailboxes. They've discovered the incredible opportunities in direct mail advertising. We've heard from people nationwide who have started a small mail order business in their spare bedroom — and within a year it becomes a lucrative, full-fledged company. From all the success stories we've seen, three reoccuring requirements: a good product or idea; a thorough understanding of the market for your product; and a computer to handle your lists.

The power of the PC allows you to manage your customer list for maximum efficiency. Using FastPak Mail, you can save money by reducing the amount of postage needed. Experts predict a sharp increase in mail order over the next several years. Specialized interest, convenience and price will attract millions of buyers to buy direct, often in favor of going to the mall or other retail outlets.

FastPak Mail Version 5 is the perfect mail order software. Designed by mail order professionals and containing features found in high-end systems, FastPak Mail 5 links directly to your database to easily import names onto labels and letters. The connection is smooth as silk, and only FastPak Mail 5 features built-in support for 1, 2, 3, 4 or 5 accross labels. It's fast and easy, yet it contains powerful functions to store names and addresses, print lists, labels, mail-merged letters, envelopes and more — right out of the box.

But FastPak Mail Version 5 is also an ideal product for keeping track of clients, contacts, club members and other lists that you use often. And new FastPak Mail Version 5 supports and prints postal barcodes — automatically! Barcodes improve deliverability and speeds you mail through the postal centers. There's built-in Carrier route sorting that can effectively reduce the cost of mailing a 29-cent letter to just 13.1 cents!

Many businesses and professionals are publishing their own newsletters, to stay in front of their current customers while soliciting new ones. It's one of the most effective "new-business" techniques you can use. A quarterly newsletter, mailed to qualified prospects, captures mindshare. Your newsletter can be followed up with news updates, new product announcements, press releases and more.

Then there's our friend from Stowe, Vermont. We call him "The Syrup Man." He bought a copy of FastPak Mail two years ago to help handle a mail campaign for his "Pampered Maple 100% Pure Syrup." He wrote the most incredible newsletter I've ever seen and mailed it to his list of visitors he had accumulated over the years. His newsletter told the history of the trees that he meticulously drained each season. He discussed his family's process of converting the rich, sweet sap into lucious maple syrup for the breakfast table. He called one day and said he'd sold at least one jar to 90% of the people he mailed newsletters. "My mailing list is a goldmine and FastPak Mail helps me take it to the bank." he told me.

Sorting, Printing and Preparation.

FastPak Mail 5 simplifies bulk mail by streamlining the entire process. It is the only product that can sort to virtually any specification, and all sorting is done to achieve the least possible cost.

Laser Printing Capabilities.

Now everything you mail can be crisp and authoritative, taking full advantage of laser technology's broad range of fonts, sizes and formats. FastPak Mail 5 is able to support internal printer fonts as well as downloaded fonts — even print sideways.

Professional Looking Envelopes.

Produce attractive envelopes that are sure to be opened! FastPak Mail 5 contains built-in envelope printing support for many printers.

Save money on bulk mailings with built-in features like 5 or 3 digit zip code sorting and automatic duplication checking. Organizing lists is easy. FastPak Mail 5 can sort lists by any criteria.

Works With All Leading Word Processors.

Import and export documents easily to and from leading word processors like WordPerfect, Wordstar, Microsoft Word, Multimate or spreadsheet programs like Lotus 1-2-3, Symphony and Excel — as well as database programs like dBASE via ASCII files.

Speedy Mail Merge.

FastPak Mail 5 will allow you to easily merge names and addresses into the body of any letter. You can quickly produce custom mailings to selected lists — even merge information into the body of your letter. And if you have existing lists stored in other applications, they can be quickly and accurately converted for use in FastPak Mail 5.

Prints Postal Barcodes.

FastPak Mail 5 supports and prints postal barcodes automatically. Barcoding greatly increases deliverability and can save you money.

FASTPAK MAIL 5

BAE1170 **FastPak Mail 5** 5¼" & 3½"	**$79.95**

Requires 512K and hard disk.

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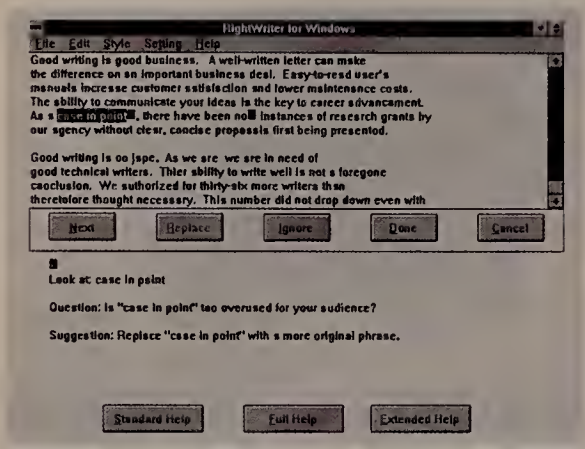
The Best Way to Improve Your Writing.

NEW WINDOWS VERSION JUST RELEASED!

New RightWriter for Windows brings the most highly respected style and grammar checker to the graphical user environment. Now, your Ami Pro, Microsoft Word for Windows, WordPerfect for Windows, and Windows Write documents can be clean and error-free—in seconds!

RightWriter for Windows uses an even better rule base to check for errors in grammar, style, word usage and punctuation than the award-winning DOS version. It's fast, easy and makes your writing more powerful than ever before.



RightWriter for Windows is a powerful expert system that applies more than 6,000 rules of good writing to your documents. With just a few clicks of your mouse, RightWriter checks your word processing documents for thousands of potential writing errors — in grammar, style, word usage, punctuation, and more!

RightWriter also rates your documents for readability and strength. These summary indexes help you target your writing to specific audiences. The result is powerful, effective writing.

RightWriter for Windows is so easy to use. The new interactive checking mode proofreads your documents just like a spell checker, offering real-time suggestions to improve your writing.

The Premier Grammar Checker.

RightWriter for Windows flags errors in your writing from a rule base of more than 6,500 rules — including rules of grammar, style, word usage, punctuation, sentence structure, subject-verb agreement and more. RightWriter for Windows can edit your documents interactively or insert its comments into a copy of your document. Either way, RightWriter displays your document with flagged errors and explanations. These explanations are your guide to better writing. The result: clear, crisp documents that deliver your ideas with maximum impact.

To use RightWriter, simply launch the product from within your favorite Windows word processor. RightWriter then interactively edits your document inserting comments and suggestions where errors occur. To correct errors, simply use RightWriter's interactive editor.

Runs Directly From Within Windows Word Processors.

RightWriter for Windows comes with launch macros so you can invoke the program directly from within popular Windows word processors. These include Ami Pro, Microsoft Word for Windows, and WordPerfect for Windows. In addition to Windows word processors, RightWriter for Windows supports a variety of DOS word processors.

B O N U S

Strunk and White's The Elements of Style

FREE With RightWriter For Windows

Free Que Book with RightWriter Windows, DOS or Macintosh. A $29.95 value.

Titles include *Using WordPerfect, Using Ami Pro, Using Windows* and more.
Free book offer ends January 31, 1992.

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BAE3360 **RightWriter PC** Dual Media	**$59.95**
BAE3365 **XENIX/UNIX**	**$199.00**
BAE3366 **Mac Version**	**$59.95**
BAE3367 **Network 5 Pack**	**$199.00**

With This Mouse, You May Never Touch Your Keyboard Again.

It's a new generation of super-mice. So advanced, they're a revolutionary advancement in mouse technology. So high-quality, the competition pales in comparison. ProHance offers 3 incredible models to fit every need. With the keys you use most right on your mouse, you'll fly through tasks with blistering speed and efficiency.

Put your most-used keys literally at your fingertips, plus all 10 Function keys. I used to go back and forth between keyboard and mouse all the time. Now I do 90% of my work right from my fast, easy mouse. PgUp, PgDn, Home, End, Insert, Delete, Backspace, Enter and Escape are all right where I need them most. I work faster and I'm more relaxed with my smartly-designed ProMouse.

PowerMouse. It's Magic.

PowerMouse has all the features of ProMouse, plus the power of amazing macros assigned to buttons on your mouse. PowerMouse uses the same key for the same function — no matter what program you're in. Press the Copy button, whether you're in Windows, WordPerfect, 1-2-3 or a slew of others, and PowerMouse performs the copy. When you learn PowerMouse, you learn 20 programs at once!

1-2-3 users say PowerMouse is mandatory for serious spreadsheet use. I formatted an entire brochure with only my mouse.

If you have limited space, there's

PowerTrack, the trackball version of PowerMouse. Laptop users — PowerTrack is a godsend. I take my laptop to class and use PowerTrack like a calculator. With its full numeric keypad, it's ideal. Then I take it to the office and use it there too!

ProMouse, PowerMouse and PowerTrack are the most exciting things ever to happen to mice. From the silky smooth movements to the space-age technology, these unique devices let you work faster, easier, smarter. And those special command keys let you work having less to remember.

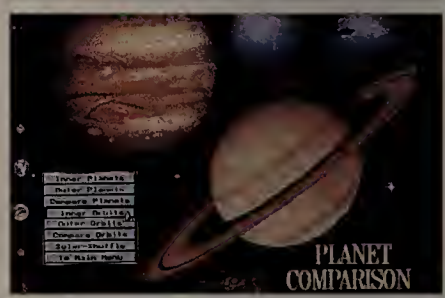
PROHANCE	
BAE4085 **ProMouse**	**$69.95**
BAE4087 **PowerMouse/100**	**$129.95**
BAE4086 **PowerTrack**	**$129.95**

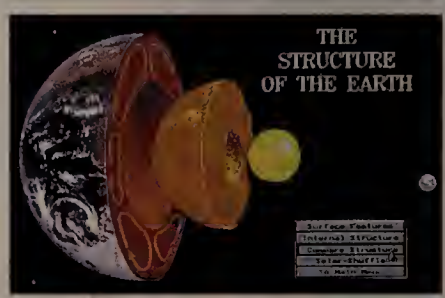
The "Space-Atlas"

Orbits is a brilliantly interactive space simulator and comprehensive space atlas that brings the universe to your PC! Spectacular 3-D graphics demonstrate the operation of our solar system. Animated sequences show you the effects of gravity on various planets, the movement of the Sun and moon. Compare the planets' characteristics, structure, chemical makeup and more. Simulations of eclipses, nuclear processes of the Sun and the life of comets. View actual satellite photographs from NASA and the Jet Propulsion Laboratory, watch a spectacular presentation on the birth and death of the Sun. See the interior structures of the Sun and moon, create reports and comparisons on anything, and play a few rounds of Orbit-Trek, the built-in brain teaser. A great educational tool, Orbits is also an entertaining way to spend some time with your PC. It brings the stars, the planets and beyond — into focus.

Just wandering through this program is a joy. Orbits is packed with so many intriguing, colorful screens and great information that it's hard to stop. It has been meticulously researched, the graphics professionally prepared. More than an astronomy program, Orbits takes you to the wonders of the universe — and gives it an interesting spin! A great program for students — even smaller children.

Software Marketing Corp.





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After Dark for Windows

Save your screen from fatal burn-in with Windows' hottest screen-saver. 30 stunning animations, sound effects, password protection and more. Easy and fun!
BAE Y1485 ..... **$29.00**

Norton Anti-Virus

Shut out deadly, spreading viruses with vital, full-time protection. Already infected? This is the remedy you need now! Trust the leader in PC know-how — Norton.
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From a simple flyer to an entire book, the all new PageMaker 4.0 for Windows is state-of-the-art desktop publishing. New graphic tools, spell checker, effects and much more.
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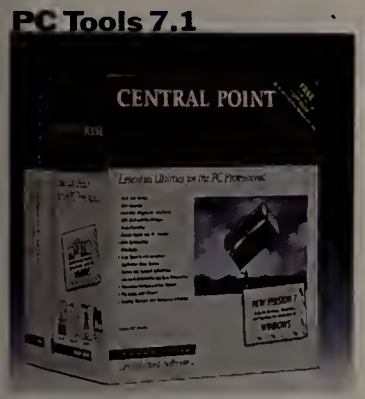

Recover lost data, back up hard disks, manage files, defragment hard disks (and double the speed). All this and more. If you own a PC, you must have PC Tools.
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Drawing and graphics on a professional level. Spectacular screens, superior prints, 150 fonts and 3500 clip-art images. We use it at Tiger. What else is there to say?
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ACT! 2.01

Track contacts, customers and prospects — then watch your productivity soar. Full history, plans, schedules and more. Plus easily customizes to fit your business.
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Update to the new DOS 5.0 for more memory, faster performance and much more. The best DOS ever! Trust your computer to the standard in the industry — Microsoft DOS.
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Manage projects easily and get the job done right! Complete, detailed tracking, multiple views, full reporting, and much more.
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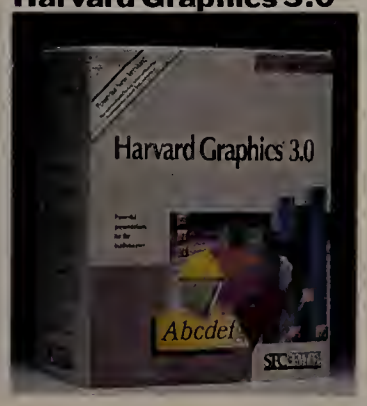

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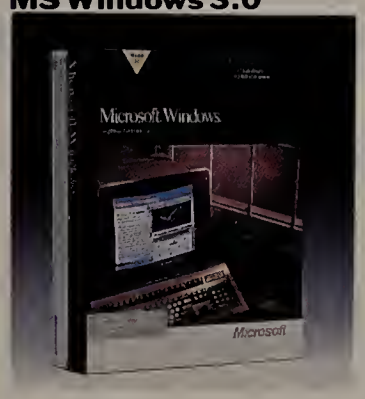

The industry predicts Windows will take over the PC world. Today's major software won't run without it. You need Windows first. Step up to the wonderful world of Windows today!
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Slip this modern miracle into any PC and watch it turn into a super-fast 9600-baud fax machine plus a high-quality 2400-baud modem. Includes Procomm and 7-year warranty.
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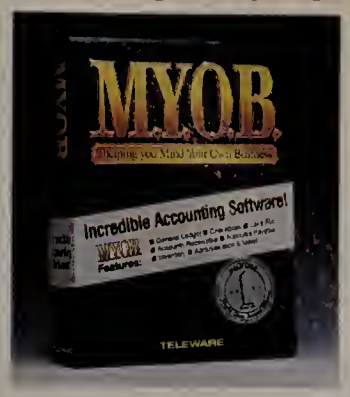

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50 megabytes of hard disk on a card! Slip it in and enjoy lightning-fast speed with acres of storage space. On-board IDE Controller has one cable for easy connection to your computer.
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Same as the XL50, but with more than twice the room! 105 megabytes of hard disk storage with ultra-fast 9ms access time. That's 8 times faster than the first AT!
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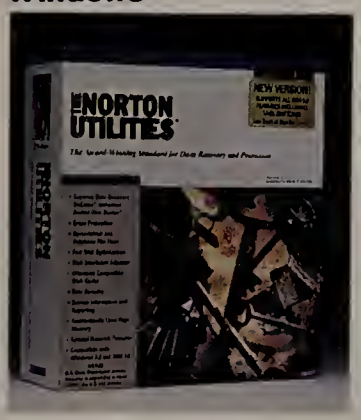

Enhance Windows with the Norton Desktop. Copy, move, view and delete with click and drag ease. Includes Backup, UnErase, SuperFind Text, screen savers and more.
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The ultimate word processor for Windows. Desktop publishing power combined with word processing speed and ease-of-use. A perfect mate for Lotus 1-2-3 and Freelance Graphics.
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The fastest and easiest Windows' desktop publisher. Perfect for newsletters, flyers and promo. Clip art, powerful text and drawing tools, spell checker, and more.
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Track expenses, assets, credit cards and loans — any personal or business money transaction. Superb reports. Windows easy, Microsoft powerful. Imports and exports Quicken files.
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PostScript fonts from the #1 quality-leader in fonts — Adobe. Pre-selected and packaged to fit special purposes. For PCs and Macs. Includes free — Adobe Type Manager! Letters, Memos & Faxes, Invitations & Awards, Overheads & Slides, Spreadsheets & Graphs.
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Powerful presentations, stirring slide shows, splendid overheads. Get your point across with the leading Windows' presentation package. A vital, easy-to-use tool for business.
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The Best-Selling Forms Software in the World!

Just Sit Down and Create a Great Form...

It's easy to see why FormTool is the best-selling forms package in the world. It's the fastest, easiest way to create, edit, manage and print custom, professional forms for immediate information gathering.

The ability to quickly gather data and put it to work is critical to corporate information flow. FormTool's "Intelligent Line Drawing" and its hardware compatibility make it an indispensable tool for businesses of any size. That's why FormTool has found a home in well over half of the Fortune 500 list, along with thousands of educational institutions, government agencies, hospitals and financial organizations around the world. They've discovered FormTool's productive power.

Unlike its competitors, FormTool doesn't require additional memory, a graphics card, color display, mouse or scanner. It runs beautifully on anything from an XT to a 486. FormTool now supports hundreds of dot-matrix, letter-quality, daisywheel, thermal as well as Hewlett-Packard printers, and new support for PostScript lasers.

Draw Forms Fast.

FormTool streamlines the PC's ability to draw forms. Lines of any weight, boxes of any size, grids of any complexity and more can be quickly drawn with just a few keystrokes. If a grid isn't quite right, one keystroke re-draws it to meet your exact specifications, then displays it on the screen with our WYSIWYG display. Zoom in to see a close-up of your form, then zoom out for the full page view. Quickly make any revisions, preview it again — then print it.

This preview capability combines the advantages of a graphics-based, on-screen display with text-based, lightning-fast processing times, making FormTool even easier to use.

Instant Revisions.

FormTool's ability to make instant revisions to your forms gives you the flexibility to create exactly the proper form to meet the requirements of your work flow. Ideal for users of any experience level.

Enter Text in Seconds.

To handle text, FormTool contains a forms-oriented word processor that allows you to move quickly through the form inserting captions, instructions, word-wrapped text and special symbols, and characters. FormTool will enter your text into position automatically.

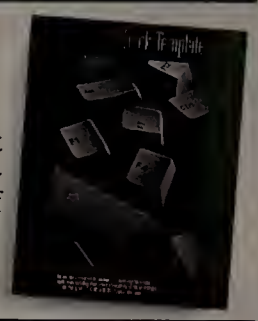
An All New Forms Manager.

And FormTool Gold contains an all new Forms Manager that makes organizing, retrieving and archiving forms faster and more efficient.

Includes a built-in backup and restore, the ability to instantly view forms from a list on your screen and a new set of features that allow you to "move," "copy," or "delete" forms from the Forms Manager. FormTool's Forms Manager also includes hard disk directory support, allowing you to store forms anywhere — or you can assemble form sets in just seconds using the sleek new menu system.

B O N U S !

FREE QUICK TEMPLATES When you buy FormTool Gold!



Quick Template is the perfect replacement for your lost plastic templates. Pop up a list of every special key from within FormTool Gold.
A $49.95 value!

FormTool Gold

BAE1020 **FormTool 3.0** 5¼" & 3½" **$79.00**
IBM PC, XT, AT, PS/2 or compatibles with 265K. Floppy or hard disk, supports all color or monochrome monitors with or without graphics cards and virtually all dot-matrix printers, daisywheel and laser printer.

Make Your PC Run up to 600% Faster!

Trapped deep within the architecture of your computer lies an enormous untapped potential for speed. Unfortunately, this vast resource has been neglected because no one could devise a way to unleash it. Until now. FAST! is the brilliant caching system that actually increases the speed of your computer by up to 600%! Simple to install, a snap to use, this software solution can make an XT with expanded memory outrun a full-blown 386! In tests, we loaded a 386 with FAST! and we almost blew the doors off the lab! (Keep reading for complete details on the head-to-head lab speed tests.)

How Can It Be Possible?

You're probably wondering exactly how this technology works. How can software have such a shattering impact on my computer? Although the authors are keeping the secret to themselves, they have shared information about where the slowdowns are within your system, where the speed is trapped and what has to be done to harness it.

They do tell us specifically, that the biggest system slowdown for your system is waiting for disk reads. When you use an application, you use it in "chunks" of various sizes, depending on the functions you are performing. Sure, you load it all at once, but it's used in bits and pieces. Your system must read back and forth, searching for these chunks of programs as they are needed by the application. Switch to another function, and the system must scramble again to find the required chunks.

A Perfectly Logical Solution...

One of the keys to the FAST! design is the addition of "intuitive logic" to the technique of caching, so your system actually anticipates what your CPU will be seeking and reads the information directly from the hard disk (or floppy) into a special buffer created within your RAM. This information is, in reality, retrieved before the system asks for it!

As a result, your CPU spends no time waiting for disk reads, so processing can be done as fast as the system is capable — faster than you've ever seen it! The more disk-intensive the application is, the more dramatic the increase in speed can be achieved using FAST! Database, spreadsheet and complex CAD systems, word processing, data transfer and more will achieve maximum response with FAST!

FAST! is also good for your system. By reducing the chaotic searches for data on your hard disk, it actually extends its life, reducing the damaging effects of constant wear. It's good for your software applications because they'll run leaner and faster, so you'll be more productive.

On a standard data transfer performance test, FAST! is 18 times faster than a standard AT — and 5 times faster than the leading competitor. In fact, an IBM XT with FAST! is faster than a Compaq DeskPro 386!

Don't Buy More Equipment!

You could spend thousands trying to achieve the speed required for truly efficient computing. Items like high-speed drives, turbo boards — even complete system upgrades try to overcome your system's inherent slowdown — waiting for disk reads.

What FAST! Can Do for a 386...

FAST! will deliver spectacular results on your IBM PC, XT, AT and PS/2, but imagine how much faster the "new generation" of ultra high-speed processing technology like the Compaq 386 or Intel's 386 Above Board will run using FAST! — they instantly leap into a new computing class!

FAST! Under Windows 3.0!

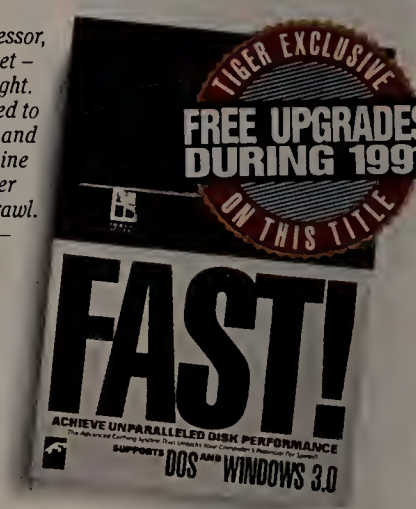
Charles Bermant, author of The Windows 3.0 Comparison, wrote "One solution (to the speed problem) is to replace Windows' disk cache, SMARTDRV.SYS, with another cache. One such program, FAST!, has made my recent Windows life a lot easier. FAST! makes everything appear faster."

On a standard Drive Evaluation Comparison test, FAST! increased performance over 1700% — and 550% over Windows' caching software!

Run your word processor, database, spreadsheet – faster than you thought. Your PC was designed to run "fast," but DOS and your hard disk combine to slow your computer down – often, to a crawl. Don't buy hardware – just install FAST!

New Version 4.0!

SAVE $20!



FAST!

BAE3460-5 **FAST!** 5¼" **$79.95**
BAE3460-3 **FAST!** 3½" **$79.95**
FAST! will run on the IBM PC, XT, AT, PS/2 and compatibles with 128K RAM and DOS 2.1 or greater. Supports fixed disk systems, and supports conventional, expanded or extended memory.

TIGERSOFTWARE To Order: **1-800-888-4437** Int'l Orders: 305-443-8212 Fax: 305-444-5010 **FREE** FEDERAL EXPRESS **SHIPPING**

Circle 259 on reader service card

An Underground Revolution In Digital Color Displays.

The NEC Multisync 2A.

One of the world's most popular monitors, capable of uncompromised VGA display as well as SuperVGA — it's two monitors in one! The color is magnificent, thanks to the 2A's analog input signal which allows an unlimited palette of colors. The resolution is crisp (800 dots by 600 lines), and it's a great way to move from VGA to SuperVGA (as our technicians say "If you ain't seen SuperVGA, you ain't seen color!").

The NEC Multisync 3FGx.

The designers and engineers went crazy on this one, packing unparalleled features and performance into this amazing new monitor. Like the new NEC FullScan capabilities, allowing you to see up to 36% more active screen display — without any distortion. Its 15″ screen is flat — perfectly flat — and provides the highest refresh rate among its so-called competitors. That means crisper images, brighter colors, richer tones and more contrast.

But the MultiSync 3FGx isn't just another pretty face — it's got a great body, too. The NEC ErgoDesign specialists have trimmed the MultiSync 3FGx with a variety of enhancements in comfort and safety. The antistatic screen eliminates dust attraction and static shock. The up-front user controls are solid, and easier to reach and use, the tilt/swivel base offers unlimited adjustment for more comfortable viewing. And (the revolution continues...) the 3FGx features NEC's Reduced Magnetic Field technology which meets stringent Swedish MPRII standards for lower FLF and VLF emissions.

The NEC Multisync 4FG.

The 4FG revolutionizes monitors in one very important area: color accuracy. This new standard in video excellence is based on the concept of multiple-frequency engineering. And only NEC can do it. The award-winning 4FG is a 15″ flat-screen, digitally controlled monitor that features AccuColor. This revolution allows you to adjust colors to your preferences, or to match your printer's capabilities — even match Pantone and Trumatch colors! Like the 3FGx, the 4FG provides crisp images — 36% larger! The Invar Shadow Mask (it's very technical) provides displays that are 20% brighter.

Another innovation: The MultiSync 4FG monitor's microprocessor-based memory and digital controls provide automatic sizing and centering of screen images for preset and custom graphics modes. Perfect for Windows and desktop publishing.

The Boss — The NEC Multisync 5D.

The MultiSync 5D has a long list of specifications, capabilities and features. It has a slew of technical innovations that set it apart from any other color display in the world. But to see what it's really all about, just look at it. An explosion of color! Blistering speed! Crisp reproduction with NO blurring and NO distortion. The 5D is the culmination of every NEC breakthrough — except bigger! A massive 20″ screen, compatible with everything from VGA to incredible 1280 by 1024 graphics, DOS and Macintosh. Perfect for Windows, high-end graphics, CAD/CAM and sophisticated desktop publishing applications. The etch screen technology delivers maximum contrast, minimum glare and the Dynamic Beam Focus allows for the sharpest corners you've ever seen in a display—edge to edge.

A Word About Glare Protection...

Let's face it. Your office isn't a Hollywood soundstage. It doesn't have a lighting director who designs the optimum lighting for your work area. So you invest in a high-quality color monitor and then struggle with the invisible color killer: glare.

The NEC MultiSync Monitor Lens has been designed to eliminate glare with the most technologically advanced glare protection device ever produced. The MultiSync Monitor Lens reduces glare (by up to 80%) and increases contrast — without loss of focus or clarity! No other glare protection can match it. The MultiSync Monitor Lens utilizes OCLI High-Efficiency Anti-Reflection coating. It's the same anti-glare technology used by NASA on the windows of all manned spacecraft, and by the US Navy on submarine periscopes.

BUY A MULTISYNC 5D — GET A *FREE* MARSTEK COLOR SCANNER!

NEC MONITORS	
BAE8512 **NEC MultiSync 2A** 14″	**$395.00**
BAE8513 **NEC MultiSync 3FGx** 15″	**$660.00**
BAE8514 **NEC MultiSync 4FG** 15″	**$780.00**
BAE8515 **NEC MultiSync 5D** 20″	**$2695.00**

Sorry free shipping is not included, and no returns on these items.

From Guttenberg To The Postscript Laser.

NEC has built two new laser printers that stand triumphantly in the long line of technical advances since Guttenberg. PostScript and NEC quality starts with the Silentwriter Series Model 90 Laser printer, complete with 35 scalable fonts, 6 pages per minute, NEC's advanced PostScript controller technology and LaserJet III emulation. It's a powerhouse with a tiny pricetag. The NEC Silentwriter Model 90 would astound the earliest printers and publishers. It produces crisp, rich type and images, 300 by 300 dpi for legal/letter paper, transparencies, labels and envelopes. The single-snap cartridge is perfect for over 6,000 pages. Its 2 Mb of RAM can handle graphics-intensive tasks. And with NEC, you'll be sure that the Model 90 is compatible. They've exhaustively engineered the most flexible printing technology ever.

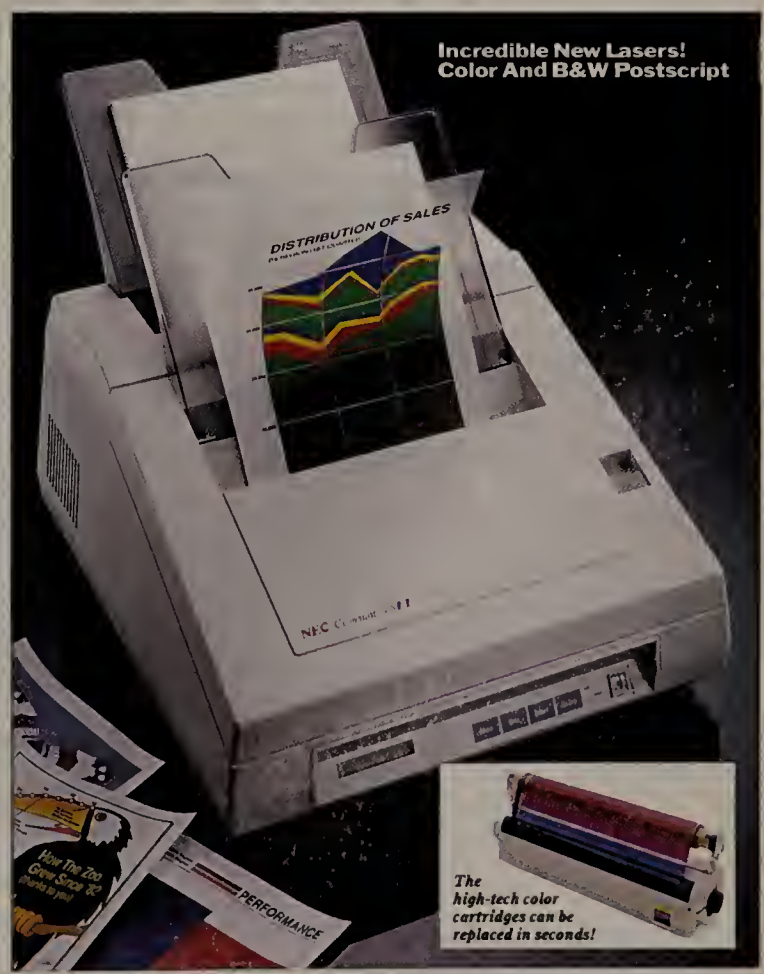
The built-in RISC processor delivers high-quality throughput up to six times faster than conventional PostScript printers, and up to three times faster than anyone's previous high performance designs.

There are no limitations here. The Model 90 allows you to use a vast range of typestyles and sizes, along with a myriad of graphic possibilities. You can print graphics with clean, black reproduction; type will look great, even at great speeds. The resident typefaces include Helvetica, Times, ITC Avant Garde, New Century Schoolbook, ITC Bookman, Palatino and Zapf Chancery.

NEC Colormate PS.

I've saved the most spectacular for last. The NEC Colormate PS. It's color PostScript at its best. You will never be satisfied with anything less after you print your first full-color page. Your competitor's presentation will pale by comparison next to your color work. Fast, timely color sellsheets and promotional materials can be produced in just a few minutes with a Colormate PS. Rich, vibrant color, approved by Pantone.

The Colormate PS's extensive support for PostScript technology assures you that it will print perfectly with popular presentation packages such as Harvard Graphics, Quattro Pro, Lotus Freelance, Microsoft PowerPoint, Adobe Illustrator, Micrografx Designer. Choose from 17 resident, scalable fonts and a whopping 4Mb of memory. It's a thrill to pull up one of your old black and white screens, colorize it, and print it in color on your new Colormate PS. That thrill will come quickly — the Colormate PS is lightning fast. It sports the powerful Motorola 68020 processor, the best in the business. The Colormate PS also includes a standard Centronics parallel, AppleTalk and RS232C/422 interfaces for simple connection to any system. A built-in SCSI interface allows hookup of a hard disk drive for font caching and fast access to permanently stored fonts and forms overlays.



NEC PRINTERS	
BAE8520 **NEC Silentwriter Model 90**	**$1695.00**
BAE8525 **NEC Colormate PS w/Free Marstek Color Hand Scanner**	**$4999.95**

Sorry, free shipping is not included, and no returns on these items.

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THE ALL-NEW CD GALLERY!

The Complete, Interactive CD-ROM Package!

This one box is your ticket to the incredible world of CD-ROM. Everything you need to get started is inside — including seven of the hottest CD-ROM software titles in the industry. Your Koss SA/30 amplified stereo speakers pump out the sound as you explore full-interactive, multimedia computing. This is a complete package, perfect for home and business.

Hundreds of thousands of diskettes' worth of information, fun and productivity are packed onto just 7 speedy CD-ROMs! They include the amazing, full-length encyclopedia, complete with enhanced sound. There's a comprehensive world atlas, presented in full-color, the incredible Battle Chess, a Time Table of History, The TIME Almanac on CD, Great Cities of The World and Mammals, from the pages of National Geographic. Without a doubt, it's the perfect introduction to CD-ROM, with everything included, nothing else to buy.

I personally found Great Cities of The World fascinating; it's packed with information on hotels in Paris, entertainment in New York, bull fights in Madrid and shopping in London.

The New Grolier Electronic Encyclopedia covers hundreds of topics in great detail. Many entries contain enhanced sound and vibrant color. It is the premier CD-ROM encyclopedia. 33,000 articles, 1,500 color graphics make learning exciting.

Switch to National Geographic's Mammals and see animated sequences and full-color photos of everything from an aardvark to a zebra. A magnificent CD-ROM title that allows you to see and hear animals in their natural habitat.

Need some hard facts about the economy? Sports? Politics? Open the TIME Almanac and get the answers from one of the most respected sources — TIME Magazine.

Or, slip in the Time Table of History: Science and Innovations. More than 6,000 interrelated entries show the chronology of historical, scientific and technological events from the beginning of time to the present day.

From there, explore the earth's geography with The Toolworks World Atlas. This package contains the most extensive collection of full-color maps you'll find anywhere. There's also plenty of data about each country and region: rainfall, population, industry and more.

For a little fun, try Battle Chess. It's chess as you've only imagined it — an entire medieval world is at war!

Amplified, Stereo Speakers!

With the free stereo headphones and a pair of Koss SA/30 amplified stereo speakers, you'll actually hear the sounds of the world when you slip in a CD — whether on CD Gallery software titles or conventional audio CDs.

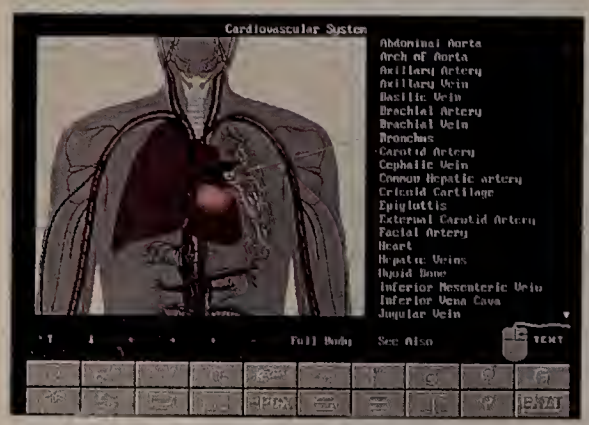
Order Today!
Limited Time Offer.
Offer expires January 31, 1992
Sorry, free shipping not included.

NEC CD GALLERY

BAE8372 **CD Gallery w/CDR-72** **$599.00**
FREE Clip Art 3-D with CDR-72 Gallery Pack!
BAE8336 **CD Gallery w/CDR-36** **$599.00**
Specify XT/AT, PS/2, or NEC Prospeed or parallel SCSI interface kit.

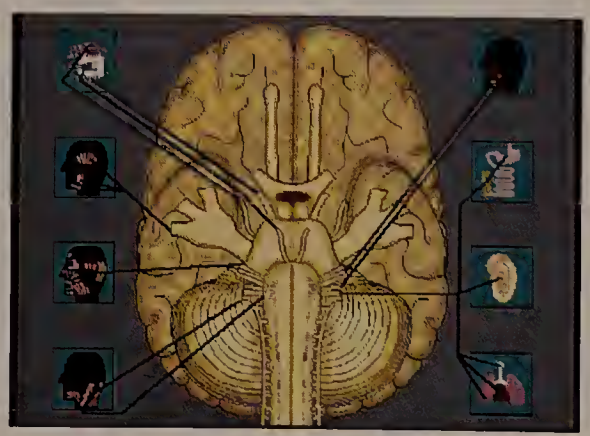
A Guided Tour of the Human Body.

The human body. A perfect machine. It grows and develops, protects and heals itself and is designed to last for decades. Now the wonder of the body is combined with the power of the PC to produce a fascinating journey into its structure and functions. You'll see detailed, full-color graphics of the entire human body and a comprehensive database of facts, descriptions and explanations. Do you know the exact function of the hypothalamus? How about the kidneys? How do bruises heal? How does the brain work, and where is your duodenum? Experience a world of knowledge and beauty that provides profound insight into life itself. It's called BODYWORKS, and it could be the most interesting software program you'll ever own — perfect for students, artists and hobbyists.



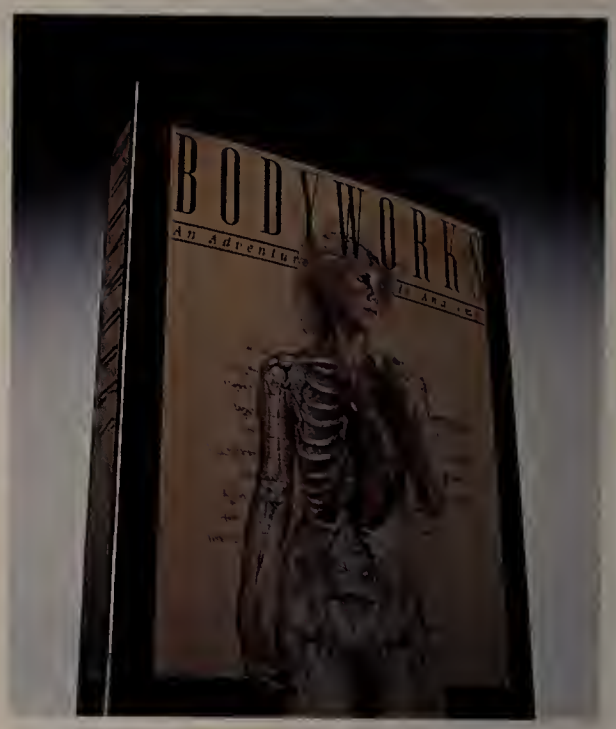
Explore the cardiovascular system...

You begin by exploring the major body systems: select the skeletal system and view the bones and how they work, the joints, mechanics of the ball and socket. Select the muscular system and see the tremendously resilient human muscle, capable of developing enormous strength. Discover how the delicate muscles in the eye allow instant focusing and movement, far beyond the capabilities of even the most sophisticated camera. Move to the nervous system, and see how the signals sent to the brain can detect even the slightest touch to the skin. Learn about how your nervous system allows the brain to instruct the body to perform complex movements — like walking! Then select the digestive system — the body's systematic breaking down of food. Its incredible ability to process and extract nutrients. From the mouth to the intestines, BODYWORKS shows you in great detail how your body nourishes itself, how it accumulates fatty tissue (and how it uses fat).



...Or discover the workings of the brain.

There are complete sections on lymphatic, endocrine and cardiovascular systems. Explore the most amazing four-square-inches of tissue man has ever seen — the human heart. How it feeds the body with a constant supply of necessary chemicals to sustain life. You'll learn how the human heart can be damaged, and exactly what happens when someone suffers a heart attack. When your child asks "Where do babies come from?" you can simply select the section on the human reproductive system for a clinical explanation of the process.



You'll see all of the organs and tissues of the body, each described in exhaustive detail. Colorful graphic screens also provide information on sports injuries, first-aid advice on illness, insect and animal bites, along with other topics. This program is simple to use — just click or select any organ or system for instant retrieval of BODYWORKS' thousands of facts. A must for the home computer.

Software Marketing Corp.

BODYWORKS

BAE4101-5 **BODYWORKS** 5¼" **$79.95**
BAE4101-3 **BODYWORKS** 3½" **$79.95**

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The Intelligent Road Atlas For Your PC!

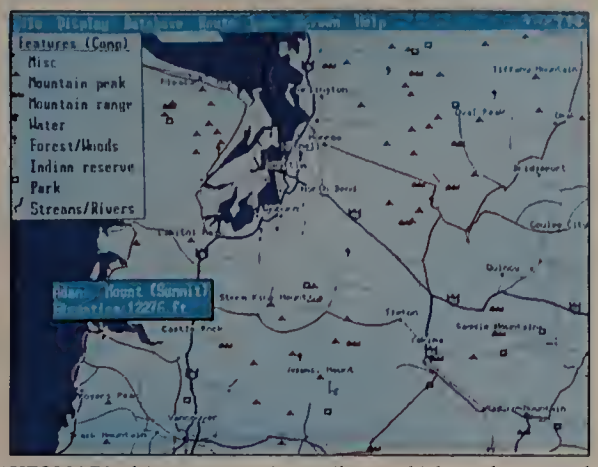
Planning a vacation? Heading out on the road on business? Now there's a system that helps you plan any road trip for fastest, prettiest or most convenient route — with hundreds of up-to-date, color maps right on your computer screen.

Clear, detailed maps that can get you anywhere in the United States that you want to go. Just tell AUTOMAP where you're going, when and where you'll be starting from, what areas you'd like to avoid, what areas you'd like to visit on the way and how you like to drive. It's fast, fun and informative.

Select your starting point, end destination, and areas to visit and let AUTOMAP create a detailed map of your next trip!

AUTOMAP's powerful intelligence takes over from there. Instantly, it searches its massive database of over 300,000 miles of roads and highways for the best route to meet your requirements. It even gives you a list of alternative routes if you decide you'd like to wander a bit.

AUTOMAP also gives you a list of "places" from over 50,000 in its database. It's like having a travel guide pointing out the very best there is to see and do. If you're a business traveller, you won't have to worry about being unfamiliar with new territories. Just a quick session with AUTOMAP and you'll not only know exactly where you're going, you'll be on the very best road to get there.



AUTOMAP's driving instructions tell you which roads to travel, how far to go, and approximate traveling time.

AUTOMAP allows you to view your entire journey as a full color map and gives you all the details on mileage. Zoom out to see the entire region, or zoom in to see every detail.

AUTOMAP's driving instructions list all the roads you'll be traveling, exactly how far to go, exactly where to turn and even the signs to look for! These maps and directions can be viewed on your screen and printed out to refer to as you need them.

Pressed for time? Need a hotel? AUTOMAP provides you with travel times, mileage, and information on hotels and attractions. It also provides information on many cities and precise directions (including landmarks) for the most scenic drives in and out of each of them. What a great vacation planner!

Government Highway Data.

AUTOMAP uses data with the renowned accuracy of government sources. It has been designed to remain accurate with constant updates of new maps and details as they become available. AUTOMAP has proven itself with the most demanding businesspeople and vacationers. It's helpful and convenient, but more importantly, AUTOMAP will save time, money and frustration. In fact, surveys show that AUTOMAP can easily save up to 20% in driving time and related costs.

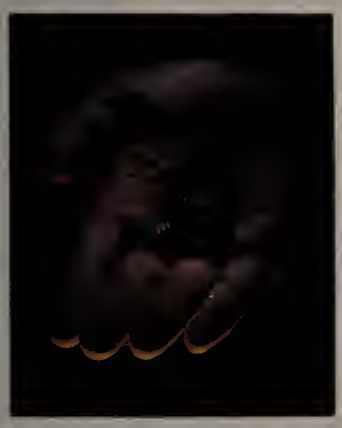
GET FREE U.S. ATLAS WITH THE PURCHASE OF AUTOMAP.

AUTOMAP	
BAE4098-5 **AUTOMAP** 5½"	**$79.95**
BAE4098-3 **AUTOMAP** 3½"	**$79.95**

Hercules, CGA, EGA, VGA, 512K RAM, hard disk, mouse recommended.

Don't Take Chances! Order Memory Direct From Tiger.

Add Memory To PCs, Macs, Printers – Enjoy Faster Computing, Load Bigger Files, Print Full Page Graphics.



If you use a computer, you know the benefit of more memory. A few more megabytes of memory can speed up everything you do many times over. Without memory you attempt to run a program or load a file only to see "Not Enough Memory". With memory you not only load it, you see it snap and pop onscreen with lightning speed.

It used to be you had to haul your computer to a shop to add more memory. But computer users have become more knowledgeable today. Why should you be without your system for a few days while it's in the shop? Why should you waste your time to deliver it and pick it up?

Top-Quality Memory.

We wanted the best memory available to offer our Tiger customers. And we're proud to present the highest quality, most reliable memory available. Offered directly from the manufacturer, **50/50 Micro Electronics,** you get top quality for practically wholesale prices. 50/50 Micro Electronics has been supplying the industrial market, and now they've decided to branch out directly. And we're glad they did. 50/50 Micro Electronics even backs up all their products with a Lifetime Guarantee.

Can You Do It?

Think adding memory is over your head? It's not so hard really. Your computer manual will tell you what kind of memory chips you need. And it will even show you a picture of where to plug them in. And if you don't have a manual, just call Tiger's friendly sales staff. They'll figure it all out and get you going.

PCs and Macs.

For PCs and all compatibles, we offer three sizes of SIMMs, which stands for Single Inline Memory Module. A SIMM is a small board with memory chips on it. You simply plug the board inside your computer. Each SIMM comes in either 256KB, 1MB, or 4MB size, to fit the right size your computer needs.

And these chips are fast! Most others sell 100ns (nano-second) chips. But our 256KB SIMM has 80ns chips, and the 1MB and 4MB SIMMs have 70ns chips. That's fast! You'll get quicker calculations and eye-popping graphics.

For the Apple Macintosh, SIMMs come in two sizes: 1MB and 4MB. With more megabytes of fast 80ns memory, your Mac will load more desktop accessories, run bigger applications, and make them come alive with blistering speed.

Laser Printers.

Ever tried to print a full page of graphics on your stock laser printer? If so, all you ended up with is a half-drawn image. The same scenario happens with word processors when you use too many fonts and graphics. Stock laser printers just don't have enough memory to complete a full page.

But the solution is simple. A memory card you slip into the side upgrades your printer for full-page graphics and all the fonts you could ever want. There are two sizes: 2MB and 4MB of memory. Which one you want depends on what you print, whether the printer is shared by others, etc. Call Tiger's knowledgeable staff for help with your decision and with all your other computing needs.

50/50 MICRO ELECTRONICS, INC.

MEMORY	
BAE 6420 **256x9 80 ns SIMM for PC**	**$24.95**
BAE 6421 **1x9 70 ns SIMM for PC**	**$78.95**
BAE 6422 **4x9 70 ns SIMM for PC**	**$329.95**
BAE 6423 **1x8 80 ns SIMM for MAC**	**$69.95**
BAE 6424 **4x8 80 ns SIMM for MAC**	**$269.95**
BAE 6425 **Hewlett Packard IIP, III, IIID 2 MB**	**$195.00**
BAE 6426 **Hewlett Packard IIP, III, IIID 4 MB**	**$329.00**

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20-MHz SXs: CLONES TURN UP THE HEAT

The 20-MHz 386SX is cheap enough for the home office yet tough enough for most business tasks. Our surprising Best Buys show that the little guys can take on Compaq and IBM in the battle of the desktop.

Michael Goodwin and Susan Silvius

Barn burners like the new 50-MHz 486s from AST, Compaq, and Dell get most of the attention these days, but when it comes to choosing a system for *your* home or overbudget business—you might need to set your sights a bit lower. Fortunately, in the PC world, the trickle-down theory really works: As superstar systems appear at the top, power and performance become increasingly affordable at the bottom. That's why today you can pick up a fully configured 20-MHz 386SX for less than $2000.

A 20-MHz 386SX is so cheap you can put one on every desk in your office, yet it packs enough horsepower to run *Windows* at a comfortable clip. It may not be fast enough for a full-time desktop publisher creating fancy reports, an engineer designing flanges with CAD software, or a financial analyst consolidating big spreadsheets, but it's just the thing for day-to-day tasks like word processing, managing a medium-size budget in your spreadsheet, or accessing a personal data base.

PHOTOS BY JEFFREY NEWBURY

Down here in the 20-MHz trenches, you won't get the best deals buying from the big-time vendors you see on TV. A number of relatively small, low-profile manufacturers have evolved, matured, and in the process scoped out a winning formula. Not only do they offer the rock-bottom prices you'd expect from a clone company, but they also give you fast performance, sound design and construction, and in many cases, surprisingly strong service and technical support.

Of course, not every clone is a winner, and several high-profile companies boast fine machines too. To find the very best 20-MHz SXs, we cast our net wide and tested 25 systems. Our Best Buys come from three clone companies: Eltech, Gateway 2000, and Micro Express. Aside from providing fast, low-cost personal computers, these upstarts deliver solid reliability and top-notch service and support that surpasses the likes of Compaq and IBM. With class acts like these, the term "clone" ceases to be a put-down.

Under the Bargain Basement

When calculating the overall value of these systems, we take into account a variety of buying issues ranging from support policies to expandability (in the photos accompanying each review, you'll see each system's overall value star rating displayed on its screen). All else being equal, however, most 20-MHz SX purchasing decisions come down to a basic price/performance comparison (see "Price/Performance: The Winning Combination" for a scatter plot showing which systems offer the best balance between the two).

Cost is the big news here: Street prices have dropped 18 percent since our June 1991 review ("People's Choice: 20-MHz 386SXs"). As we go to press, the basic buy-in for a full-featured 386SX/20 system hovers around $1800, including 4MB of RAM, a 105MB hard disk, and a color super-VGA display. Naturally, you can spend more if you load up with accessories or buy from a bigger-name vendor, but you can also drop below $1500 if you order 2MB of RAM and a 60MB disk.

As for performance, our benchmarks can help you decide, but there's nothing like a hands-on test flight with your favorite program to see if a system is right for you. If you currently use a 286, or a 16-MHz 386SX or DX, you'll see the improvement in a flash using the same applications. A 386SX will also deliver the benefits of full-blown *Windows* enhanced-mode multitasking, but don't expect to switch between programs quickly. If that's what you're after, a 25- or 33-MHz 386DX would be a better choice.

Judging by this roundup, the clone is alive and well: Good deals are springing up all over the map. Of course, you may not get that warm fuzzy feeling you'd get from a Compaq or IBM—even in hard times, these giants aren't going to disappear overnight. But if you choose carefully, there's no reason not to buy a low-priced winner.

Michael Goodwin is an associate editor and Susan Silvius the assistant technical editor for PC World.

For more information about all products in this article, circle reader service no. 904.

Buying Smart: Sniffing Out SX Bargains

Even though you're saving a bundle on your new 386SX/20, you needn't settle for less than full functionality. You should insist on a system that runs all your software quickly and reliably and comes with plenty of slots and drive bays. A generous service-and-support package is another essential.

PERFORMANCE

Performance testing produces a series of numbers, only some of which will have relevance to you. If you plan to buy a different hard disk from the ones tested here, your best indicators of inherent speed are the processor-intensive *1-2-3* benchmarks, which we weight higher when calculating our performance ratings. Most of the fastest systems here, such as the overall speed champ, AST's Premium II, offer a memory cache. But unlike with a 25-MHz or 33-MHz 386, where a cache almost always means top performance, caching is not a definitive indication of speed on a 20-MHz SX—for example, the cacheless HP Vectra 386/20N is one of the fastest systems in the roundup, even in the *1-2-3* tests, where a cache would do the most good.

PRICE

Bargains have never been so numerous. We base our cost comparisons on street price. So you can compare the figures intelligently, we price every system in the same standard configuration: 4MB to 5MB RAM, 100MB to 200MB hard disk, floppy drive, mouse, VGA, color VGA monitor, and DOS (a few exceptions are noted in the text). If you can get along with 2MB of RAM and a 60MB hard disk, you can calculate a rough price by deducting $300 from the street price. For every machine except those sold directly, we call PC dealers in major cities across the country and get multiple price quotes. Results for each system are then averaged. The low-ball boss in this roundup is Fast Micro's $1738 FastData 386/SX-20c.

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SERVICE AND SUPPORT

With many of these machines destined for small offices that have no MIS staff, good service and support is critical. All these systems offer at least 12 months of warranty—but choose carefully if you want free (or low-cost) on-site service. The alternative is shipping the system back to the factory or dealer. Companies take two basic approaches to phone support: Some offer direct support, others expect their dealers to provide it. We evaluate central support by calling each number three times and scoring answers for accuracy and responsiveness, with extra credit for long hours, fax lines, and BBS's. We rate dealer support by tallying the requirements vendors impose on dealers for training, inventory, and dedicated support staff; we give extra credit when vendors operate their own stores. Top service-and-support honors in this roundup go to Blackship.

DESIGN AND CONSTRUCTION

When you use a system every day, design flaws can slow you down. You should have a tilt-and-swivel monitor, a reset button for when <Ctrl>-<Alt>-<Delete> doesn't work, and a compact footprint to save desk space. You'll also want switchless setup for easy configuration and an easy-open case. Most important, you deserve a machine that works reliably with all popular hardware and software: We run these systems through tough compatibility tests. AST's Premium II took the top design spot.

FAST-RAM CAPACITY

Windows demands large amounts of RAM—and you'll need fast RAM (memory installed on the motherboard or on a special 32-bit memory board) to get top performance. While 8MB may sound like plenty of headroom now, if you want to plan for the future, look for a system that lets you install at least 16MB of fast RAM.

EXPANDABILITY

You always need more drive bays and slots than you think. If you're going to use your PC as a stand-alone unit, we recommend four bays—enough to hold two floppy drives (ideally a 3½-inch and a 5¼-inch unit), one hard drive, and a tape backup. And with every year bringing more expansion board add-ons (tape backup and CD ROM controllers, internal modems and fax boards, scanners, sound boards, bus mice), look for at least four free slots. If you'll be networking your PC (and sharing the server's big disk), you can probably get away with three bays and three free slots. One more thing: While a CPU upgrade path is uncommon in this price range and platform, three of these systems (ALR, AST, and NCR) do let you upgrade your CPU, which means your new system can remain useful over time. Blackship, Eltech, Fast Micro, Swan, and Zeos tie for top expandability.

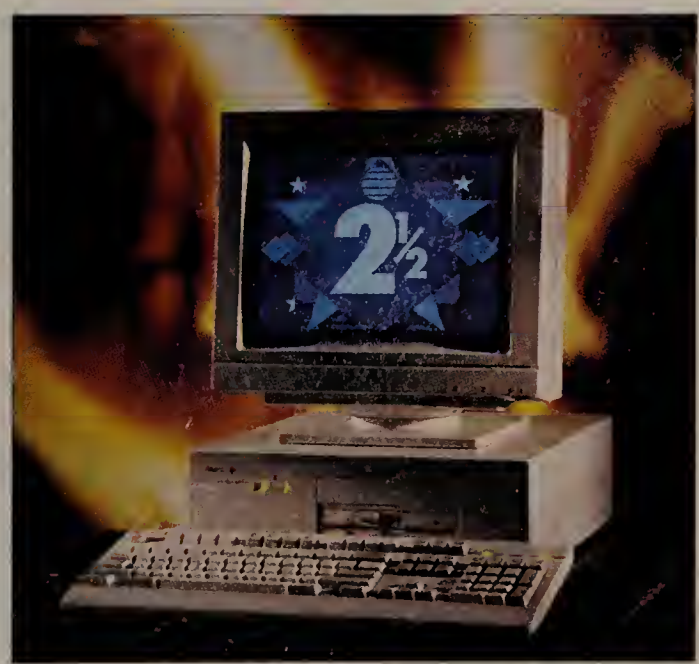
Acer 1120SX

PROS: 24-month warranty, switchless setup

CONS: Expensive, no requirement for trained, dedicated support staff

At first glance Acer's 1120SX looks like a winner: From its roomy, well-designed case to its front-mounted power button, this speedy SX appears well worth the rather steep $2622 price. Another nice touch is switchless setup: If you add memory or install a new peripheral, you won't go groping for DIP switches.

Performance was respectable overall, but the lack of a memory cache caused it to score poorly on the processing-intensive *1-2-3* test. More disturbing, Acer earned only a fair service and support rating. The company offers no direct support line so you'll have to go through your dealer, and Acer does not require its dealers to maintain a trained, dedicated support staff. So if you buy this well-made model, make sure your dealer can back you up with support. (Acer released a new CPU-upgradable 386SX at press time. See the preview in this issue.)



The Acer 1120SX is well constructed, but a high price and dealer-only support work against it.

ALR PowerFlex 20SX

PROS: Upgradable CPU, solid service and support

CONS: 5MB RAM ceiling, limited to 80MB hard drive, slow 1-2-3 performance

ALR's $2353 PowerFlex 20SX is one of only three systems in this roundup that let you upgrade your CPU. You can plug in a 486SX/20 module ($895) or a 486DX/25 ($1695). But memory access in the upgraded ALR is still 16 bit, so performance—not terribly impressive with this system—may not improve as much as you hope. In other ways, this system is ill prepared for the future. If you want a disk larger than 80MB, you'll have to buy it from a third party and install it yourself. Worse, the system's 5MB fast-RAM ceiling ties for lowest in the roundup, so you may not be able to run future applications at top speed.

Technical support is very good, and the documentation is excellent. With its robust case and CPU upgrade path, this system is worth considering—but with its slow scores on processor-intensive tests and 5MB fast-RAM limit, you're better off shopping around.

Think you might move up to a 486? You'll love the PowerFlex's CPU upgrade path but not the low 5MB fast-RAM limit.

For $2751 you could buy a 486SX instead, but the Arche Triumph makes sense as a fast Windows workstation.

Arche Triumph 386SX-20

PROS: Very fast Windows performance, nice keyboard, strong support package

CONS: Expensive

The Arche Triumph 386SX-20 is a solid machine that boasts strong performance—and for a steep $2751, it better. The Triumph did particularly well on the *Windows* benchmarks, where it ranked within seconds of top place. You get *Windows* as part of the package, and a high-quality keyboard and adjustable monitor stand make this a comfortable workstation with good ergonomics.

You get a reassuring 24-month warranty, and Arche's service and support policies are among the best. The quality of support was less inspiring, however—some advice was too vague to be useful. Thanks to the unit's high-quality construction, however, you may never need service or support. The keyboard was particularly outstanding. The Triumph 386SX-20 may not be cheap, but it's still a good value, especially for *Windows* users.

AST Premium II 386SX/20

PROS: Fastest system tested, best CPU upgrade option, huge fast-RAM capacity

CONS: Pricey

If you want to work fast today and even faster tomorrow, you'll love the AST Premium II 386SX/20. It delivered the best overall performance scores in the roundup and provides a top-flight upgrade path. Unlike the other upgradable systems reviewed, the Premium II's upgrade board carries up to 16MB of fast, on-board, 32-bit RAM, so your system memory will be every bit as fast as the speedier CPU you're installing. You can move up to a 33-MHz 386 ($1545), a 20-MHz 486SX ($1595), or a 33-MHz 486DX ($2595). However, considering that the unit costs $2532 to start with, these upgrades are not cheap. You can buy AST's Premium II 486SX/20 for $3841—around $300 less.

The easy-open case provides lots of room to grow, and you'll find front-mounted controls. On-site service is standard; tech support works on weekends, but with speed like this, chances are you won't.

You can't find a faster 386SX than the AST, and when you're ready to really rock and roll, you can turn it into a 486.

Blackship BLK 386SX/20

PROS: Low price, excellent performance, fine service and support

CONS: 8MB fast-RAM limit, flimsy keyboard

Blackship's BLK 386SX/20 is a mail-order steal. For only $1860, you get speed, shipshape construction, and plenty of slots and bays. You say you want more? Add on-site service, 48-hour turnaround on repairs, and a toll-free tech support line that answered quickly and accurately every time we called. In fact, Blackship's box comes within a hair of a Best Buy—only its low 8MB fast-RAM ceiling and a flimsy keyboard hold it back. (Of course, it's worth remembering that you can buy an excellent third-party keyboard for around $100.)

This system's complement of six slots and five drive bays is roomy to begin with, but if you want more, say to set up the system as a fax or modem gateway for your network, Blackship will sell you the BLK 386SX/20 in a tower case. Whether you're considering the desktop or tower model, this low-priced speedster is a winner.

The Blackship BLK 386SX/20 typifies the clone nouveau: impressive workmanship, top speed, dependable support.

Compaq is still Compaq, and the Deskpro is still a fast, well-designed machine. But the $3296 price gives pause.

Compaq Deskpro 386s/20

PROS: Fast, easy-open case, switchless setup

CONS: Expensive, no on-site service

Compaq is famous for building brawny boxes, and the Deskpro 386s/20 is no exception. Despite its small footprint, there's enough room inside this rugged unit for four drive bays. And the Deskpro delivers on Compaq's other point of pride: top performance. This system offers impressive scores, especially on *1-2-3*, *WordPerfect*, and *Windows*. The Deskpro is clearly a good value, even at $3296, but we wonder how long Compaq can continue to charge such high prices when many bargain basement–clone vendors offer better service and support. The answer, apparently, is "not long at all"—at press time Compaq announced it would make significant price cuts on all its systems.

Compaq's recent decision to provide central, toll-free telephone support is good news, but there's still no on-site service or turnaround policy. But if you can afford it, the Deskpro 386s/20 is a good deal.

CompuAdd 320sc

PROS: Fast, DOS and Windows preinstalled

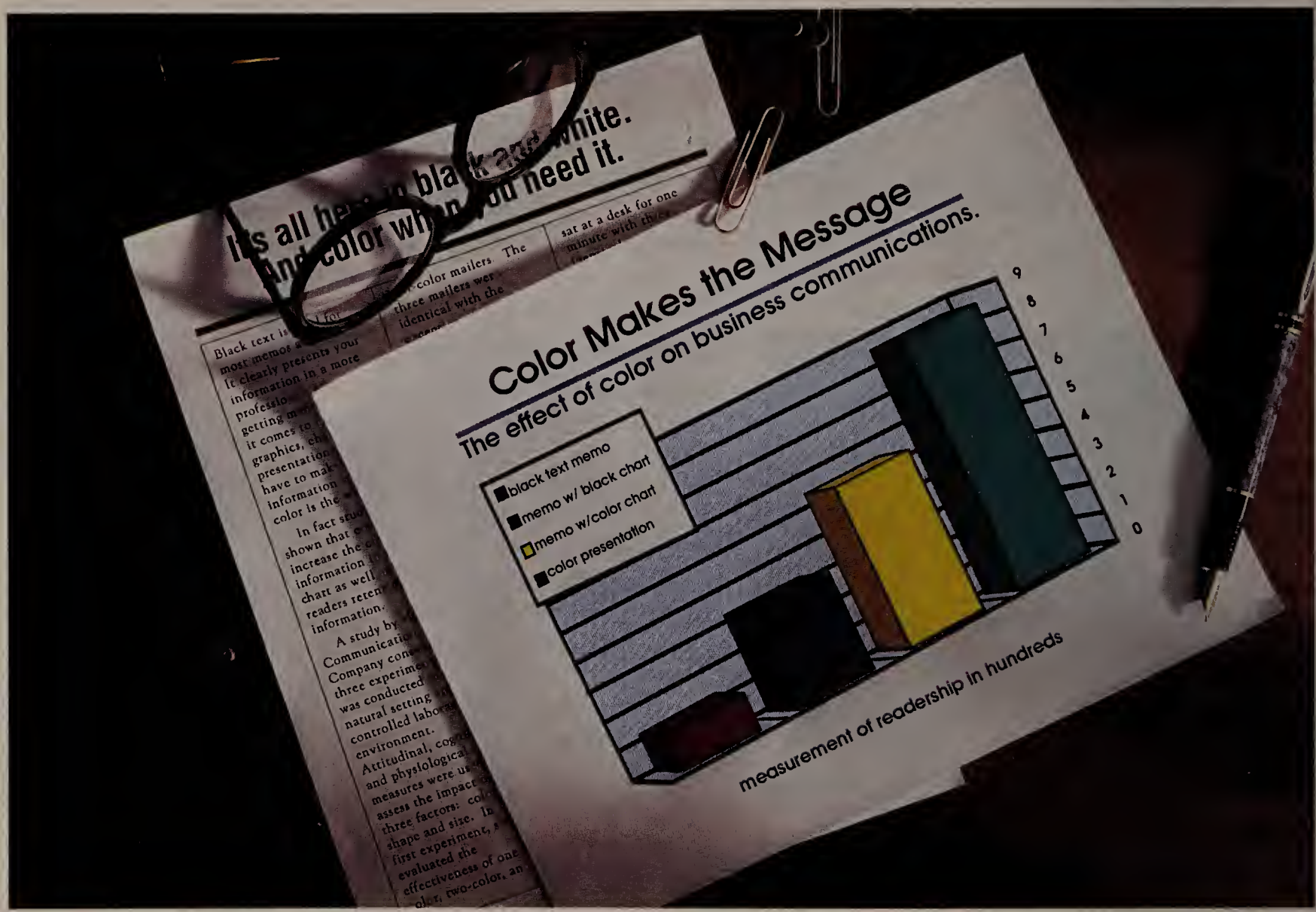
CONS: Fairly high price

CompuAdd's 320sc is a good poker player with an almost great hand. This former Best Buy holds three of a kind with sizzling performance, ample expandability, and a generous service-and-support policy. And it has a strong card in the hole: The 320sc arrives ready to go with DOS and *Windows* preinstalled—a major benefit if there's no computer expert at your beck and call. But its relatively high $2475 price eliminates this mail-order speedster from the Best Buy circle this time around.

CompuAdd seems determined to make sure you get your service and support from the fastest source: You can work through your local dealer, fax, BBS, or via a toll-free 11-hour-a-day central support line staffed by courteous technicians. Even if the 320sc doesn't take top honors, this solid plug-and-play system could be a big winner.

Friendly support, fast performance, and preinstalled software make CompuAdd's 320sc a top value.

What's the business world coming to?



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Dell System 320SX

PROS: Small footprint, outstanding service and support

CONS: Fairly expensive, limited fast-RAM and board capacities

Dell is known for high-quality systems and first-rate service and support, and the 320SX is no exception. But with more and more equally reliable 386SXs selling for a song, Dell's $2547 price is less impressive than it used to be. In addition, you're limited to 8MB of fast RAM, and the compact footprint case has room for only three expansion boards and three drives—plenty if you're planning to use your new SX as a network workstation, but limiting if you're going solo.

A front-mounted on/off switch and a responsive keyboard make life easier, and the switchless setup and pictorial documentation will get you up and running ASAP. The main draw: Free on-site service, helpful, toll-free tech support (even on weekends), and 24 daily hours of auto-fax support. The moral of the story: If a $2547 sticker doesn't raise your blood pressure, you can't go wrong.

This little Dell went to market with a somewhat rotund $2547 price, but the 320SX has a rugged design and solid support.

Eltech's bargain-priced 2200 is the quintessential Windows machine, giving you speed and preinstalled software.

Eltech Model 2200

PROS: Very fast, inexpensive, lots of slots and bays, Windows and DOS preinstalled

CONS: Soft keyboard touch

Eltech must be doing something right—not only did this low-profile company walk away with an October 1991 Best Buy for 25-MHz 386s, now it's grabbing an award for the SX category, too. For only $1899, the Model 2200 gives you dazzling performance—this racer finished first in our *Windows* speed test, second on *1-2-3,* and took fourth overall—leaving Compaq, Dell, and IBM (among others) in the dust.

Home users will be pleased to discover that the 2200 comes with DOS and *Windows* preinstalled—and an interactive tutorial gets you up to speed fast. If problems arise, informed, toll-free technical support is available by phone or fax. Well, okay, there *is* one fault: The keyboard feels a bit flimsy. But even so, you'll look long and hard before you find a deal as good as Eltech's Model 2200.

Epson Equity 386SX/20 Plus

PROS: Fast, easy-open case, switchless setup

CONS: Expensive

If *1-2-3* and *WordPerfect* are the kinds of applications that fill your workday, Epson's Equity 386SX/20 Plus will get you home sooner. Fast scores on these old reliables boosted the Epson to a four-star performance score. You'll also like the clean, uncluttered chassis, a keyboard that's a pleasure, and a pop-off top that makes installing add-on cards and drives a breeze. But for $2934, you better hope you can write this off with the IRS.

The Equity 386SX/20 Plus comes with a dynamite service-and-support package that will make home buyers and owners of small businesses breathe easier. The package includes on-site service, 10 hours of daily toll-free tech support, and a BBS. The Equity's price may not be as equitable as you'd like, but this solid workhorse should give you years of satisfactory service.

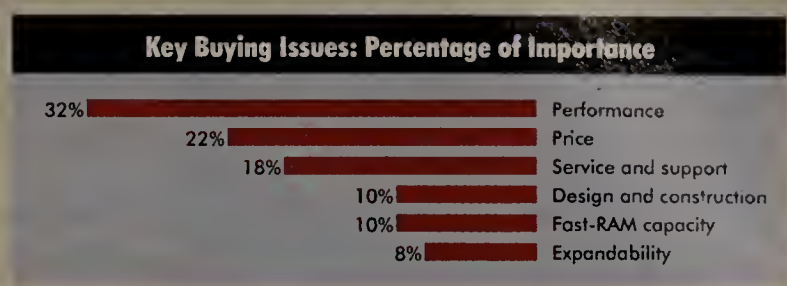
A speed demon at basic DOS applications, the friendly Equity eases the hassle of adding cards and drives.

Clone Fever Strikes the 386SX

Up-and-coming Eltech, Gateway, and Micro Express offer the best 20-MHz 386SX deals.

BEST BUY

If you're shopping for a 20-MHz 386SX, cost counts, so you'll likely be checking out the affordable systems found in mail-order ads and on superstore shelves. But these days clones have more to offer than low prices. Top performance, superb service and support, and ample room to grow mark our Best Buy 386SX desktops from Eltech, Gateway, and Micro Express.



Excellent ★★★★
Good ★★★
Fair ★★
Poor ★

	Reader service no.	Performance	Price	Service and support	Design and construction	Fast-RAM capacity	Expandability	Overall value
Acer 1120SX	687	☆☆☆½	☆½	☆☆	☆☆☆	☆☆	☆☆☆½	★★½
ALR PowerFlex 20SX	689	☆☆½	☆☆½	☆☆☆½	☆☆☆	☆½	☆☆☆½	★★½
Arche Triumph 386SX-20	690	☆☆☆☆	☆	☆☆☆	☆☆☆½	☆☆☆☆	☆☆☆☆	★★★
AST Premium II 386SX/20	691	☆☆☆☆	☆☆	☆☆☆	☆☆☆½	☆☆☆☆	☆☆☆☆	★★★½
Blackship BLK 386SX/20	692	☆☆☆☆	☆☆☆☆	☆☆☆☆	☆☆☆	☆☆	☆☆☆☆	★★★½
Compaq Deskpro 386s/20	693	☆☆☆☆	½	☆☆☆	☆☆☆	☆☆☆☆	☆☆☆☆	★★★
CompuAdd 320sc	694	☆☆☆☆	☆☆	☆☆☆½	☆☆☆	☆☆☆☆	☆☆☆½	★★★½
Dell System 320SX	695	☆☆☆½	☆☆	☆☆☆☆	☆☆☆½	☆☆	☆☆☆☆	★★★
Eltech Model 2200	696	★★★★	★★★★	★★★½	★★½	★★★★	★★★★	★★★★
Epson Equity 386SX/20 Plus	697	☆☆☆☆	½	☆☆☆½	☆☆☆½	☆☆☆	☆☆☆½	★★★
Fast Micro FastData 386/SX-20c	698	☆☆☆	☆☆☆☆	☆☆☆½	☆☆	☆☆☆☆	☆☆☆☆	★★★½
Gateway 386SX/20c	699	★★★★	★★★★	★★★½	★★★	★★★★	★★★½	★★★★
HP Vectra 386/20N	700	☆☆☆☆	½	☆☆	☆☆☆½	☆☆☆☆	☆☆	★★½
Hyundai Super-386STc	701	☆☆☆½	☆☆☆	☆☆☆	☆☆☆	☆☆☆☆	☆☆☆½	★★★½
IBM PS/2 Model 57 SX-049	702	☆☆½	½	☆☆☆	☆☆☆½	☆☆☆☆	☆☆☆½	★★½
Leading Edge D3/SX-20c	703	☆☆☆½	☆☆☆☆	☆☆☆½	☆☆☆	☆☆☆☆	☆☆☆½	★★★½
Micro Express ME 386SX/SL/20	704	★★★★	★★★★	★★★½	★★★	★★★★	★★★½	★★★★
Mitac MPC 2386E	688	☆☆☆	☆☆	☆☆☆☆	☆☆☆½	☆☆	☆☆☆½	★★★
NCR PC386sx/20	705	☆☆☆½	½	☆☆☆	☆☆☆	☆☆	☆☆☆½	★★½
Northgate SlimLine 386	706	☆☆☆☆	½	☆☆☆½	☆☆☆	☆☆☆☆	☆☆☆☆	★★★
Swan 386SX/20	707	☆☆☆½	☆☆½	☆☆☆½	☆☆½	☆☆	☆☆☆☆	★★★
Tangent 320S	708	☆☆☆☆	☆☆☆	☆☆☆☆	☆☆☆	☆☆☆☆	☆☆☆☆	★★★½
Tri-Star 386SX 20	709	☆½	☆☆☆☆	☆☆☆½	☆☆	☆☆	☆☆☆☆	★★½
Twinhead Superset 590/20	710	☆☆☆	☆☆☆½	☆☆☆☆	☆☆☆	☆½	☆☆☆½	★★★
Zeos 386SX/20	711	☆☆☆☆	☆☆½	☆☆☆½	☆☆☆	☆☆☆☆	☆☆☆☆	★★★½

Overall value is calculated by multiplying each category rating by the category's weight percentage, summing the results, and rounding to the nearest half number.

Fast Micro FastData 386/SX-20c

PROS: Extremely low price, lots of slots and bays

CONS: Desqview compatibility problems, slow Windows and Paradox performance

Fast Micro's $1738 entry is the cheapest system in our roundup and one of the most expandable. It turned in solid performance scores on all our tests except *Paradox,* where it placed dead last, and *Windows,* where it placed second to last. Other problems: You'll need to set motherboard switches during setup, and if you decide to install a math coprocessor, you'll find the socket virtually impossible to reach. Also, we had problems trying to run *Desqview:* The cursor kept disappearing, and we couldn't select some menu choices.

The FastData boasts six expansion slots and five drive bays—one of the highest counts in the roundup. Technical support is toll-free by phone or fax, and on-site service is available. If your budget is crunching *you,* the FastData 386/SX-20c could be the answer—especially if you want to load your system with boards and drives.

With the lowest price in the roundup, Fast Micro's FastData offers surprisingly good expandability and support.

Is Gateway the new Dell? On top of superb price/performance, this Best Buy delivers great service and support.

Gateway 386SX/20c

PROS: Inexpensive, cheap RAM, programmable keyboard

CONS: Only three full-length slots

Sometime in the last year, this South Dakota mail-order company finally came of age. Gateway's speedy 386SX/20c has a low $1895 price, and you'll pay only $50 per megabyte for RAM upgrades (many vendors charge $100). This Best Buy also comes with *Windows* and DOS 5.0 preinstalled, plus a programmable keyboard with 24 function keys.

Service and support are very good. Toll-free technical support is available 18 hours a day and on weekends. You can reach technical support by BBS and fax, as well—and our questions were answered accurately every time we called. Performance is excellent on the processor-intensive *1-2-3* and *WordPerfect* tests, but it's not one of the speedier systems when running *Windows.* Still, the Gateway 386SX/20c is a value-packed system at a lovable price.

HP Vectra 386/20N

PROS: Very fast, small footprint

CONS: Very expensive, limited board and drive capacity, tech support $117 annually

The antithesis of the modern clone vendor, Hewlett-Packard already has its customers, and it aims to keep them loyal. High performance is your prime payoff with HP's Vectra 386/20N: It placed second overall in our speed tests. Moreover, a compact, easy-open case and a crisp keyboard make using this PC a pleasure. The trade-off is in low expansion capacity: You get only two drive bays and three expansion slots, one of the poorest counts in this roundup. The Vectra also sports an astronomical price: $3704 (with an undersized 94MB hard disk). For this kind of money you can buy a 486SX or even a 25-MHz 486.

And the high costs don't stop after purchase. Tech support will cost you $117 a year. Once you pay the price, however, support is first-rate. Between its high price, limited expandability, and pay-as-you-go support, the HP Vectra 386/20N is overshadowed by the competition.

No 386SX should be this expensive, even with the HP Vectra's blazing performance and durable construction.

Hyundai Super-386STc

PROS: Fast 1-2-3 scores, inexpensive

CONS: Slow hard disk

A painless $2085 puts you in the driver's seat of Hyundai's Super-386STc. This system did especially well on the processor-intensive *1-2-3* and *WordPerfect* tests, but placed near the bottom on the *dBASE* and *Paradox* benchmarks, suggesting a slow hard disk. Except for its keyboard, which could use better springs and cushions, the system's ergonomics are nicely conceived: Power and reset buttons are front-mounted for convenience, and its compact case will find space on even the most crowded work surface.

Hyundai includes a generous 18-month warranty, but support could be a problem; it's available only through Hyundai dealers (computer dealers, not car dealers!), and there's no guaranteed turnaround time. If you can get your dealer to pop in a higher performance drive than the standard model, this Super system is worth a serious look.

Hyundai's desktop is well suited to CPU-intensive tasks like 1-2-3, and its 18-month warranty aims to please.

IBM's 386SX is distinguished by exemplary design and an innovative 2.88MB floppy drive, but it's slow and expensive.

IBM PS/2 Model 57 SX-049

PROS: 2.88MB floppy, Micro Channel, SCSI port, easy-open case

CONS: Expensive, slow

At $3934 the 57 SX-049 is more than *twice* the price of any of our Best Buys, yet it finished next to last overall in our speed tests. However, IBM's late entry into the SX market will keep the PS/2 faithful happy with an easy-open case and Micro Channel architecture that permits painless installation of peripherals.

The Model 57 SX-049 boasts a humongous capacity for expansion. Each system has room for five MCA cards and four drives and has a SCSI port that lets you connect an external 1.2GB drive. In addition, IBM's high-capacity 2.88MB 3½-inch floppy drive is so capacious, you may not need a tape backup. It also reads and writes to 720K and 1.44MB disks. The 57 SX-049 is well suited to storing and accessing large amounts of data, but with its high price and slow performance, it's far from a power user's dream.

Leading Edge D3/SX-20c

PROS: Inexpensive, great ergonomics, Windows included

CONS: Tech support via 900 number only

Leading Edge is known for its bargain-level prices, and the compact D3/SX-20c continues that grand tradition. This well-built system gives you solid performance for only $1913. Moreover, the D3's ergonomics are first-rate: Monitor and case have front-mounted controls—Leading Edge even places the keyboard and mouse ports up front so you'll have plenty of room to stretch out.

Technical support is available 11 hours a day by telephone, fax, or BBS. We found the staff pleasant and thorough, but unfortunately you have to call via a 900 number. Not only does this mean you could run up quite a support bill, but it could pose a problem if your office phone system does not permit such calls. Still, with its comfortable design, compact case, low price, and *Windows* included, the Leading Edge D3/SX-20c is a very good value at a great price.

If you don't mind a tech support 900 number, you'll be happy with Leading Edge's low price and thoughtful design.

FEATURES EVALUATION

386 Service With a Smile

The cream of the clone vendors are besting old reliables in the all-important service-and-support category. Best Buys from Eltech, Gateway, and Micro Express also give you plenty of room to add options.

● Yes
○ No
n/a = not applicable

	Acer 1120SX	ALR PowerFlex 20SX	Arche Triumph 386SX-20	AST Premium II 386SX/20	Blackship BLK 386SX/20	Compaq Deskpro 386s/20 [1]	CompuAdd 320sc [1]	Dell System 320SX	Eltech Model 2200	Epson Equity 386SX/20 Plus
Standard features										
Street price[2]	$2622	$2353[3]	$2751	$2532[4]	$1860	$3296	$2475	$2547	$1899	$2934
External memory cache (K)	0	0[6]	0	16	32	32	32	0	32	32
Bus	ISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA
Windows included	●	○	●	○	○	○	●	●		○
Expandability										
Free 32-bit slots	0	0	0	0[7]	0	0	0	0	0	0
Free 16-bit slots	4	4	4[8]	4	5	4	4[8]	3	6	3
Free 8-bit slots	0	1	1[8]	1	1	0	1[8]	0	0	1
Externally accessible/internal drive bays[10]	2/1	3/1	4/0	3/2	3/2	3/1	2/2	2/1	5/0	2/1
Largest hard disk option	338MB	80MB	650MB	210MB	1.4GB	320MB	200MB	320MB	400MB	200MB
Upgradable CPU	○	●	○	●	○	○	○	○	●	○
Fast-RAM capacity (MB)	8	5	16	80	8	16	32	8	16	14
Accepts standard SIMMs	●	●	●	●	●	●	●	●		●
Design and construction										
Switchless setup	●	●	●	●	○	●	○	●	●	●
Setup utility in ROM	●	●	●	●	●	○	●	●		○
Compact footprint	●	●	●	●	○	●	○	●		●
Tilt-and-swivel monitor	●	●	●	●	●	●	●	●		●
Front-panel on/off switch	●	●	○	●	●	●	○	●	●	●
Parallel/seriol/mouse ports	1/2/1	1/1/0	1/2/0	1/2/1	1/2/0	1/1/1	1/2/0	1/2/1	1/2/0	1/1/1
Service and support										
Warranty (months)	24	12	24	12	12	12	12	12	12	12
On-site service available	●	●	●	●	●	○	●	●		○
Turnaround policy	5 days	none	none	7–10 days	48 hours	none	48 hours	24 hours	48 hours	48 hours
Free unlimited support	○	●	●	●	●	●	●	●		●
Vendor support										
Central support/toll-free	○/○	●/○	●/●	●/●	●/●	●/●	●/●	●/●	/	●/●
Daily support (hours)	0	10	9	11	9	12	11	14	8.5	10
Weekend support	○	○	○	●	○	○	○	●	●	○
Electronic BBS/fax	○/○	●/●	●/○	●/●	○/●	○/○	●/●	●/●	●/	●/○
Vendor-to-dealer support										
Dedicated support staff required	○	○	○	○	n/a	●	●	n/a	●	●
Support staff training required	○	○	●	○	n/a	●	●	n/a	●	●
Dedicated support line for dealers	●	●	●	●	n/a	●	●	n/a	●	●
Inventory and parts requirement	●	○	●	○	n/a	●	●	n/a		○
									BEST BUY	

[1] Best Buy in February 1991.
[2] Standard configuration includes 4MB to 5MB RAM, 100MB to 200MB hard drive, one floppy drive, VGA and color VGA monitor, mouse, at least one parallel and one serial port, and DOS.
[3] With 80MB drive.
[4] With 210MB drive.

Fast Micro FastData 386/SX-20c	Gateway 386SX/20c	HP Vectra 386/20N	Hyundai Super-386STc	IBM PS/2 Model 57 SX-049	Leading Edge D3/SX-20c	Micro Express ME 386SX/SL/20	Mitac MPC 2386E	NCR PC386sx/20	Northgate SlimLine 386	Swan 386SX/20	Tangent 320S	Tri-Star 386SX 20	Twinhead Superset 590/20	Zeos 386SX/20
$173B	$1895	$3704[5]	$20B5	$3934	$1913	$1764[4]	$2492	$4025	$2B99	$2295	$2090	$1B49	$2025	$2295
32	32	0	16	0	32	32	0	0	64	0	32	64	0	0
ISA	ISA	ISA	ISA	MCA	ISA	ISA	ISA	MCA	ISA	ISA	ISA	ISA	ISA	ISA
○	●	○	○	○	●	●	○	○	●	○	●	●	○	●
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	5[9]	3	3	5	4	2	4	4	3	5	5	3	4	6
2	0	0	1	0	0	2[9]	1	0	2	1	0	3	0	1
5/0	2/1	2/0	3/0	4/0	3/1	2/1	3/1	2/1	2/1	3/1	4/0	3/2	3/1	4/3
660MB	500MB	120MB	300MB	160MB	210MB	1.2GB	200MB	200MB	210MB	400MB	340MB	1.2GB	200MB	1.1GB
○	●	○	○	○	○	●	○	●	○	○	○	○	○	○
32	16	16	16	16	16	32	B	B	16	B	32	B	5	16
●	●	○	●	○	●	●	●	○	●	●	●	●	●	●
○	●	○	○	●	○	●	○	●	○	○	○	○	○	●
●	●	●	●	○	●	●	●	○	●	●	●	●	●	●
○	●	●	●	○	●	●	●	●	○	○	○	●	●	○
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	○	○	●	●	●
1/2/0	1/2/1	1/2/1	1/2/0	1/1/1	1/2/1	1/2/0	1/2/0	1/1/1	1/2/0	1/2/0	1/2/0	1/2/0	1/2/0	1/2/0
12	12	12	18	12	20	15	12	12	12	24	12	15	12	12
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
48 hours	none	72 hours	none	48 hours	72 hours	48 hours	72 hours	72 hours	7 days	none	48 hours	none	48 hours	48 hours
●	●	○	●	○	○	●	●	○	●	●	●	●	●	●
●/●	●/●	●/●	○/○	○/○	●/○	●/●	●●	○/○	●/●	●/●	●/●	●/●	●/●	●/●
7.5	18	12	0	0	11	8.5	10	0	24	12	9	14	10	24
●	●	○	○	○	○	●	○	○	●	●	○	●	○	●
○/●	●/●	●/○	○/○	○/○	●/●	●/●	●●	○/○	○/○	●/●	●/●	●/●	●/●	●/●
n/a	n/a	○	●	●	○	n/a	○	●	n/a	n/a	n/a	n/a	○	n/a
n/a	n/a	○	●	●	○	n/a	○	●	n/a	n/a	n/a	n/a	○	n/a
n/a	n/a	●	●	●	●	n/a	●	●	n/a	n/a	n/a	n/a	○	n/a
n/a	n/a	○	●	●	○	n/a	○	○	n/a	n/a	n/a	n/a	○	n/a
	BEST BUY					BEST BUY								

[5] With 94MB drive.
[6] Upgradable to 32K.
[7] Includes three proprietary 32-bit upgrade slots that can function as standard 16-bit slots.
[8] One is half-length.
[9] Two are half-length.
[10] Half-height or third-height bays. At least one externally accessible bay is 5¼ inch, except for the HP Vectra 386/20N.

The new OL830 had to be smarter than the LaserJet® III to earn the Okidata OK!™

Smart.

- **Smart price: $1999.00***
- Gives you the best font scaling and graphic output from over 5000 different software applications.
- Offers 17 scalable plus 26 bitmapped fonts, standard.
- 2 megabytes of memory for full-page graphics.
- Optional second paper tray for second sheets, alternate letterhead.
- 5-year printhead warranty. (Plus 1 year parts/labor on entire printer.)

Not So Smart.

- **Not-so-smart price: $2395.00***
- Only supports font scaling and graphics from a few hundred software applications without expensive brain surgery.
- The best it can manage without costly add-ons is 8 scalable and 14 bitmapped fonts.
- 1 meg is all you get, standard. Can't even remember one full page of graphics.
- No place to add a second tray. You're stuck with only one kind of paper at a time.
- Standard 1-year warranty. Not so smart.

If you think buying the smartest 8 page-per-minute business printer is a smart business move, we think you'll agree Okidata's new OL830 is a stroke of pure genius.

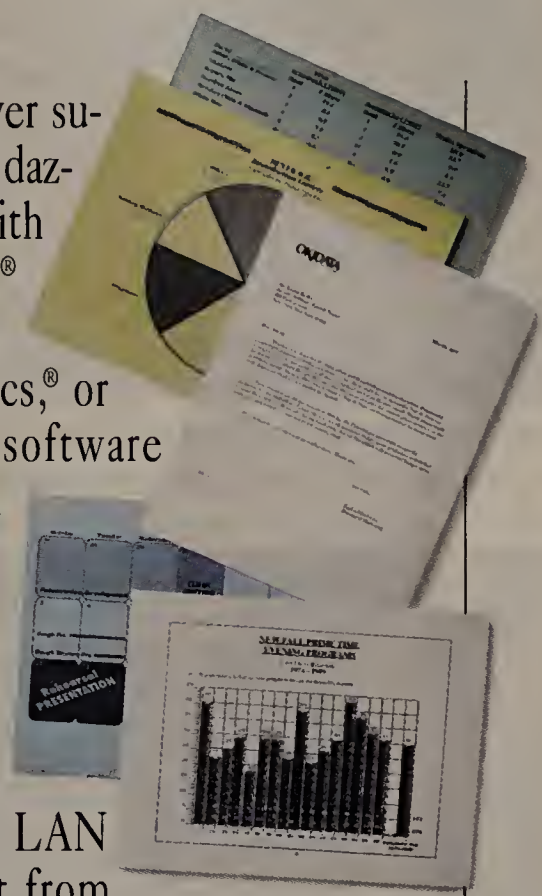
It Takes Brains To Make A Smart Printer.

PC MAGAZINE EDITORS' CHOICE November 26, 1991 Okidata OL830

Okidata's newest printer takes just about every important feature of the LaserJet III and adds an IQ boost all its own. The OL830 offers more typefaces and fonts for better-looking documents, and more standard memory for full-page graphics. An optional second paper tray fits underneath to switch between letterhead and second sheet, or plain paper and envelopes, without reloading. And the OL830's 5-year printhead warranty is the longest in the industry. All for a suggested retail price that's hundreds of dollars less than the LaserJet III. No wonder PC Magazine just gave the Okidata OL830 their Editors' Choice award, naming it the best inexpensive printer of its type available.

So Smart, It Already Knows Your Software.

To give our smart printer even more smarts, we include Printer Control Panel™ autoswitching software from LaserTools®–a $149 value. By switching automatically between *both* major printer emulations (Adobe's® PostScript® *and* HP® LaserJet), the OL830 will deliver superb output and dazzling graphics with WordPerfect,® Lotus® 1-2-3,® Harvard Graphics,® or just about any software package, present or future, DOS or Windows.™ Since it's also fully Novell® network-certified, users on a LAN can send output from different applications at any time without printer headaches.



Our Smartest Feature: The Okidata OK!

Most important, the OL830 comes with the Okidata OK!–our personal pledge that your new Okidata printer will provide not just adequate performance, but exceptional performance–not merely good value, but outstanding value.

For additional information, or the name of an Okidata dealer in your area, please call us at 1 (800) OKI-DATA.

OKi OK! OKIDATA OK!

We don't just design it to work. We design it to work wonders.™

*Manufacturer's suggested retail price. Dealer prices may vary. HP and LaserJet are Reg. T.M.'s of Hewlett Packard Inc. PC Magazine is a Reg. T.M. and the PC Magazine Editors' Choice logo is a T.M. of Ziff-Davis Publishing. Adobe and PostScript are Reg. T.M.'s of Adobe Systems Inc. Printer Control Panel is a T.M. and LaserTools is a Reg. T.M. of LaserTools Corp. WordPerfect is a Reg. T.M. of WordPerfect Corp. Lotus and 1-2-3 are Reg. T.M.'s of Lotus Development Corp. Harvard Graphics is a Reg. T.M. of Software Publishing Corp. Windows is a T.M. of Microsoft Corp. Novell is a Reg. T.M. of Novell, Inc. Okidata is a Reg. T.M. and Okidata OK! is a T.M. of OKI Electric Industry Co., LTD. "We don't just design it to work. We design it to work wonders." is a T.M. of OKI America Inc.

Circle 197 on reader service card

Micro Express ME 386SX/SL/20

PROS: Great price, very fast, small footprint, Windows included

CONS: Only two 16-bit slots

At a mere $1764, the Micro Express ME 386SX/SL/20 misses the lowest price in the roundup by only $26—and you even get a copy of *Windows*. You won't sacrifice performance, either: This Best Buy finished very close to the top on almost every benchmark. The result is the best price/performance ratio in the roundup (see "Price/Performance: The Winning Combination"). A few nit-picks: Two of the four slots can handle only half-length 8-bit cards. And if you like to place the keyboard in front of the case, you'll find that position blocks access to the bottom drive bay.

Micro Express provides a superb service-and-support bundle, including a 15-month warranty. If you're looking for a fast, inexpensive system with all the right stuff (and who isn't), you'll find that the Micro Express ME 386SX/SL/20 is an outstanding value.

Super price/performance, a compact case, and a free copy of Windows make the Micro Express a Best Buy.

Mitac MPC 2386E

PROS: Super service and support, plenty of room for drives and bays, very good design

CONS: Fairly expensive, flimsy keyboard

With a relatively high $2492 price and relatively slow performance, Mitac's MPC 2386E starts out with two strikes against it. But from then on it scores easily. The compact case is so well designed it provides room for five expansion cards and four drive bays. Other nice touches include a front-mounted power switch, reset button, and keyboard port. And the documentation is thorough and well organized.

Mitac's service and support is exemplary. You get a 12-month warranty plus on-site service. The toll-free technical support line is on duty 10 hours every weekday, and our questions were consistently answered with impressive accuracy. So even if the Mitac MPC 2386E won't dazzle you with its price or speed, its solid design, super support, and strong performance make it a good choice—especially if you expect to be adding a lot of drives and boards.

The well-made 2386E puts everything up front, including the power switch, reset button, and keyboard port.

NCR PC386sx/20

PROS: SCSI port, CPU upgrade

CONS: Expensive, tech support costs extra

The NCR PC386sx/20 is one of two Micro Channel machines in this roundup—and it offers real competition to IBM's PS/2. While the NCR's $4025 price is $91 higher than the IBM's, it outperformed the IBM on every speed test and offers a SCSI port, too. On the other hand, it has one less slot than the IBM (four instead of five) and one less bay (three instead of four), and it lacks the IBM's 2.88MB floppy drive. A $1900 486SX/20 CPU upgrade is available, but there's no way to achieve 32-bit memory access, so the upgrade still won't be quite as fast as a true 486SX machine right off the shelf.

NCR provides service and support via dealers—and you'll pay extra for it, too. However, NCR does require dealers to have a trained, dedicated support staff. The NCR is a speedy alternative to the IBM, but unless you *must* have the Micro Channel, you can find better choices.

The NCR is faster than its IBM Micro Channel rival, but it's still too costly for most SX buyers.

Northgate SlimLine 386

PROS: Very fast, 24-hour technical support, Windows included

CONS: Expensive, only three 16-bit slots

Even in today's lugubrious economy, there are some buyers who could not care less what the price tag says: Just give them speed, speed, and more speed. In other words, just give them the Northgate SlimLine 386. This system is one of the fastest we tested—especially at *Windows*—and its price includes a copy of *Windows*. If you're looking for a bargain, however, the SlimLine 386 is not the PC for you: At $2899, it costs over $1100 more than our Best Buy Micro Express. The low-profile case holds three drive bays and five expansion slots—but only three of those slots can handle a 16-bit card.

Service and support are excellent. On-site service is available, and you can reach a technician toll-free 24 hours a day, seven days a week. If you are willing to pay extra for top-notch speed and support, the Northgate will deliver everything you need from a desktop.

The SlimLine comes with a copy of Windows and runs it at a dazzling clip. It's expensive, but it's one of the best.

Load up the wagon! Swan's 386SX/20's roomy interior can handle all your expansion needs.

Swan 386SX/20

PROS: Lots of slots and bays, very good service and support

CONS: No switchless setup

Actually, the $2295 386SX/20 is more of a workhorse than a swan: You can load it up with drives and peripherals thanks to its generous complement of six slots and four bays, and it will still trot through its work load with respectable scores on *Paradox* and *Windows*. However, if you want to keep your memory options open for a future of RAM-hungry applications, you may run up against the Swan's 8MB fast-RAM ceiling. And setting up the system isn't very fast, unless you're a master at flipping switches on the motherboard.

Swan gives you a 24-month warranty, and the capable workaholics at Swan's toll-free tech support center toil 12 hours a day, even on weekends. You can also reach Swan by fax and BBS. The 386SX/20 is not the cheapest choice in the roundup, but if you need room to grow, the Swan makes good horse sense.

Tangent 320S

PROS: Fast Windows and dBASE performance, excellent support, Windows included

CONS: No switchless setup

The Tangent 320S actually *looks* like a clone, with a stripped-down case that's the PC equivalent of a plain brown wrapper. Its only external extravagance is a reset button. But even if this system isn't loaded with personality, at a reasonable $2090 (with *Windows* included), who cares? It runs at a respectable clip (especially with *dBASE* and *Windows*), and there's plenty of room to add drives and expansion cards. Documentation could use some improvement, though: The index occasionally refers you to nonexistent page numbers.

Tangent Computer has strong service-and-support policies, including a 48-hour turnaround, toll-free technical support, and on-site service. If you're a *Windows* or *dBASE* user, you'll find the Tangent 320S a solid value, with good performance and plenty of room to expand. After all, good looks aren't everything.

It may not look flashy, but you can't tell a PC by its cover: Tangent's 320S turns in solid performance scores.

Tri-Star 386SX 20

PROS: Low price, Windows included
CONS: Very slow, compatibility problem

Selling for a low $1849, the Tri-Star 386SX 20 reminds us of the clones of yesteryear: amazingly cheap but a bit glitchy and oh, so slow. This PC finished a distant last in every speed test. Other irritants include a relatively low fast-RAM limit (8MB) and a setup scheme that requires switch setting. Also, when we tried to install an internal modem, we had problems disabling COM1 and ended up having to disable the built-in game port as well.

The Tri-Star offers a few nice touches, however, including front-mounted power and reset buttons and a 15-month warranty. Free on-site service is part of the package, and technical support is available toll-free 14 hours a day. Unfortunately, not all our questions were answered accurately. With faster, more dependable systems selling for even less, the Tri-Star 386SX 20 is not a great bargain.

The $1849 price is tempting, but last-place performance and a hardware incompatibility give us the strength to resist.

The Superset's generous service and support and reasonable price are appealing, but the low 5MB RAM ceiling isn't.

Twinhead Superset 590/20

PROS: Good price, strong service and support
CONS: 5MB fast-RAM limit

You can take a Superset 590/20 home for only $2025, and although the compact unit will leave you plenty of elbowroom, you'll still have room for four drives and four expansion boards. Unfortunately, the low 5MB fast-RAM limit won't cut it for *Windows* power users.

If you're worried about entrusting your hardware purchase to a clone vendor, Twinhead's service-and-support package will help you breathe easier. Free on-site service is included, and 48-hour repair turnaround is guaranteed. The toll-free tech support runs 10 hours a day, and we found the tech staff's answers accurate and helpful. This speedy, low-priced machine is worth a look for users who don't expect to move beyond basic applications over the next three to five years that you plan to stare into the Superset 590/20. But if you see a lot of RAM-hungry *Windows* multitasking ahead, you'll want to keep looking.

Zeos 386SX/20

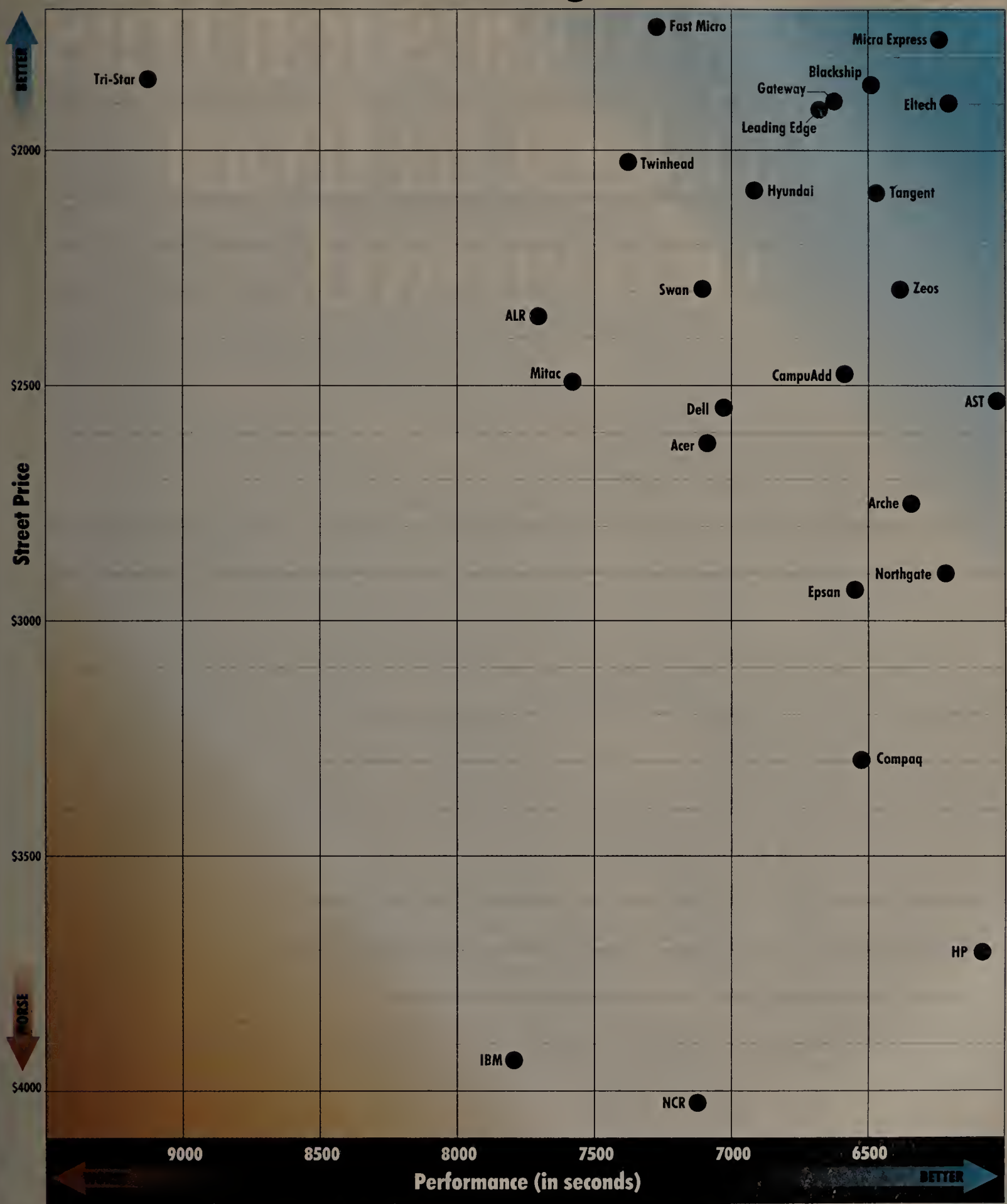
PROS: Excellent Windows performance, huge capacity for drives and boards
CONS: Keyboard lacks positive feedback

If you're looking for a fast *Windows* workstation, and it seems that just about everybody is these days, check out the $2295 Zeos 386SX/20. Its performance on *Windows* was particularly strong: It finished exactly one second out of first place. Most SX systems are compact in size and modest in reach, but not the overachieving Zeos—its enormous chassis provides a serverlike expansion capacity and room for seven drives and seven expansion boards. This is the best count in the roundup. And if you need to fill those bays with high-capacity storage, Zeos offers a 1.1GB SCSI drive that can fit the bill.

Zeos includes a strong service-and-support package, with on-site service and 24-hour tech support even on weekends. If you crave top speed and lots of expansion room and don't require the lowest price, Zeos's 386SX/20 is a terrific value.

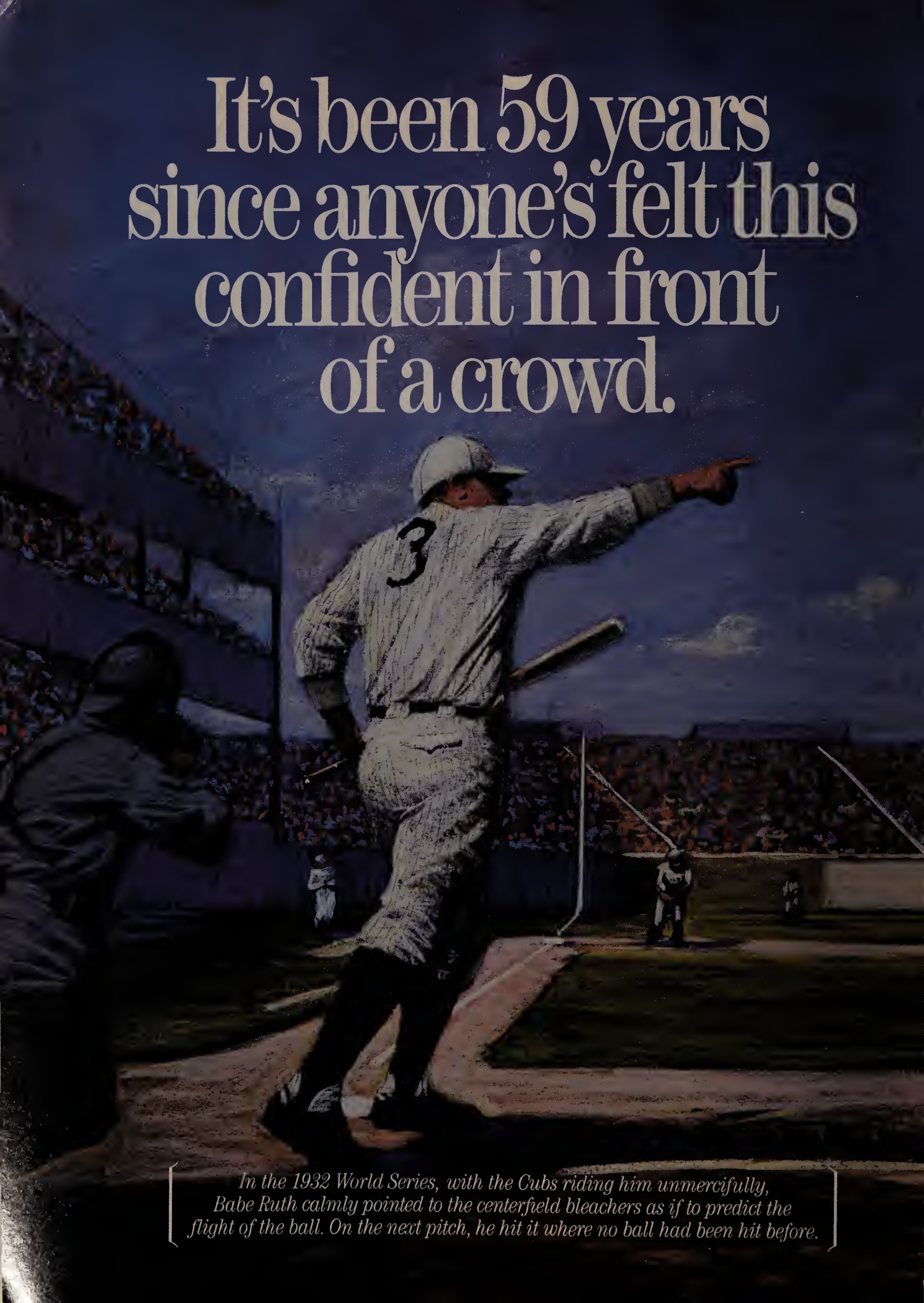
Zeos delivers fleet performance along with a humongous capacity for slots and bays.

Price/Performance: The Winning Combination



The key criteria in evaluating a 20-MHz 386SX are price and performance. In the chart above, systems with the best price/performance ratios, such as our Best Buy from Micro Express, appear in the upper right corner. The price rating is based on the street price of the models in our standard configuration. The performance numbers are based on the total number of seconds the systems scored in PC World Test Report benchmarks, modified by the weighting used to arrive at the Executive Summary performance rating: 1-2-3 40 percent, WordPerfect and Windows each 20 percent, Paradox and dBASE each 10 percent.

It's been 59 years since anyone's felt this confident in front of a crowd.



In the 1932 World Series, with the Cubs riding him unmercifully, Babe Ruth calmly pointed to the centerfield bleachers as if to predict the flight of the ball. On the next pitch, he hit it where no ball had been hit before.

Now your next presentation can be a big hit.

Now you can be more confident your next presentation will be as big a hit as Babe's. Because the new Freelance Graphics™ for Windows™ does most of the work for you.

The fun begins with QuickStart, an animated on-line tutorial that coaches you—step-by-step—through the process of creating a stunning presentation.

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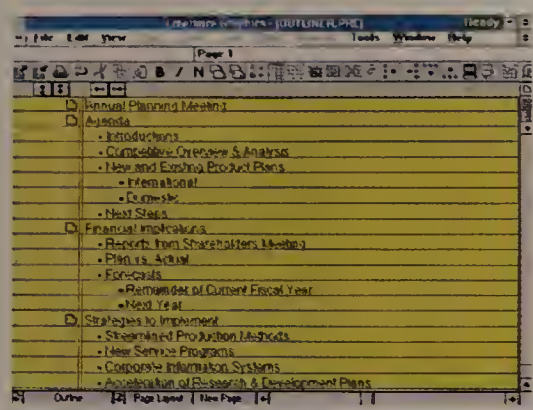


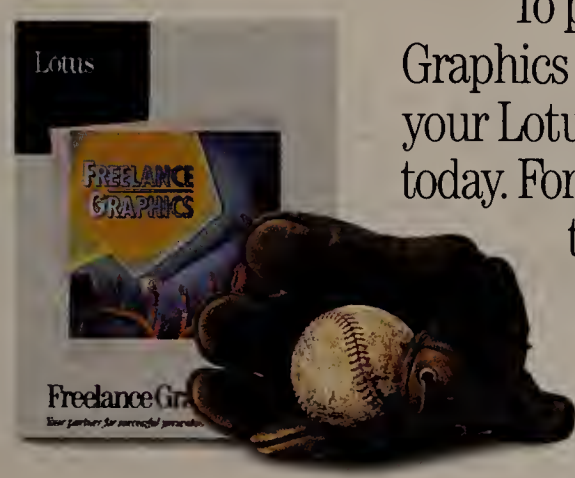
Use this view to outline your points. As you type, SmartMasters create presentation pages for you automatically.

1. Select the look. And let SmartMasters do the design work for you. Of course, you can still customize the look any way you choose.

2. Fill in the blanks at the prompts. Add your message or place your graphs where indicated on the screen.

3. See the big picture in Page Sorter. Add, delete, rearrange or combine pages from other presentations and you're ready to go.

SmartMasters™ that automatically manage the design of your presentation. Smart Charting automatically composes data charts to fit the available space. And the Symbol Gallery offers you over 500 full-color clip art images. Of course, Freelance Graphics is fully integrated with all



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Freelance Graphics for Windows

Lotus

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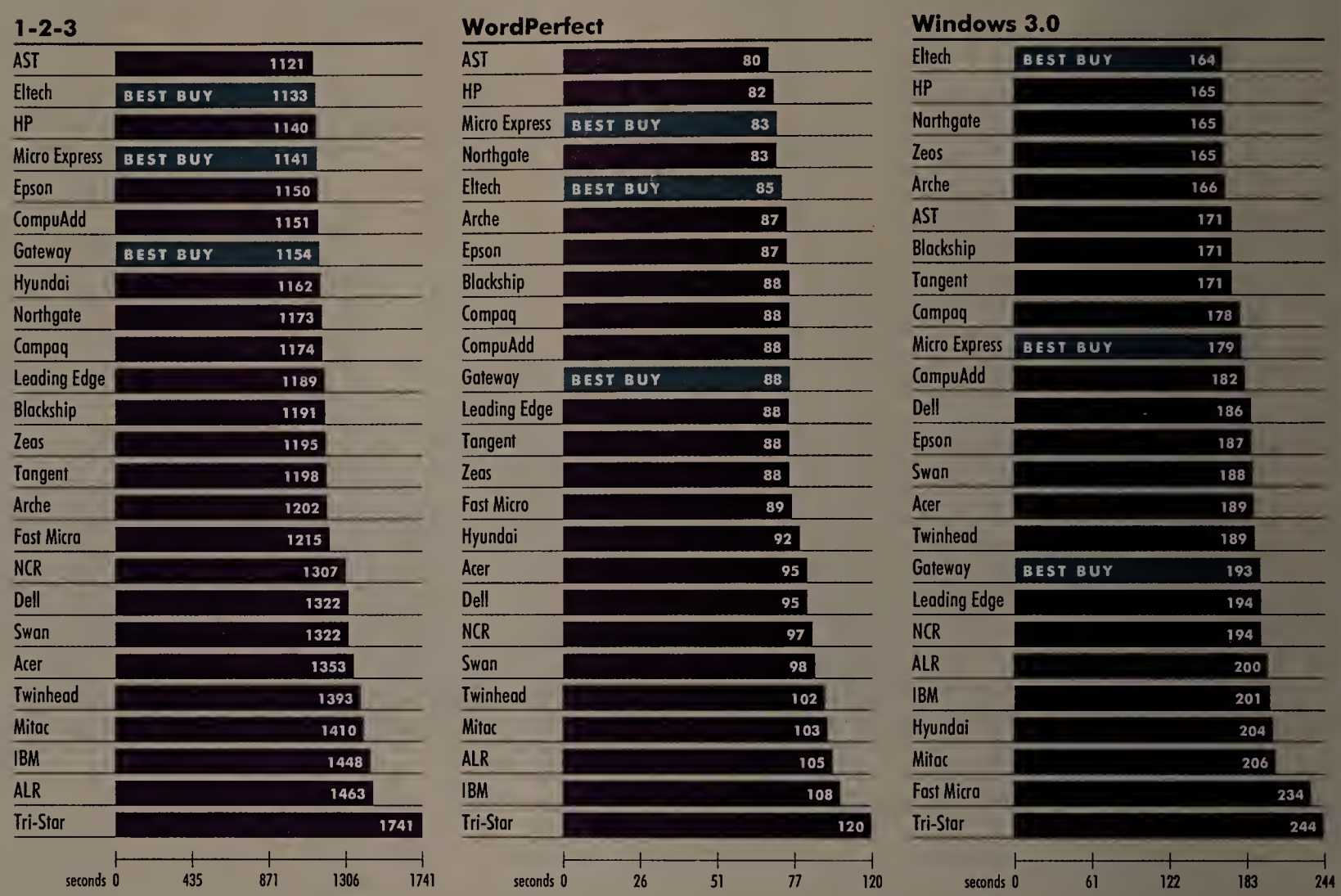
PC WORLD TEST REPORT

Cache the Wave: Faster 386SX Systems

Like most of the faster 20-MHz systems here, the top-ranked AST Premium II offers a built-in memory cache.



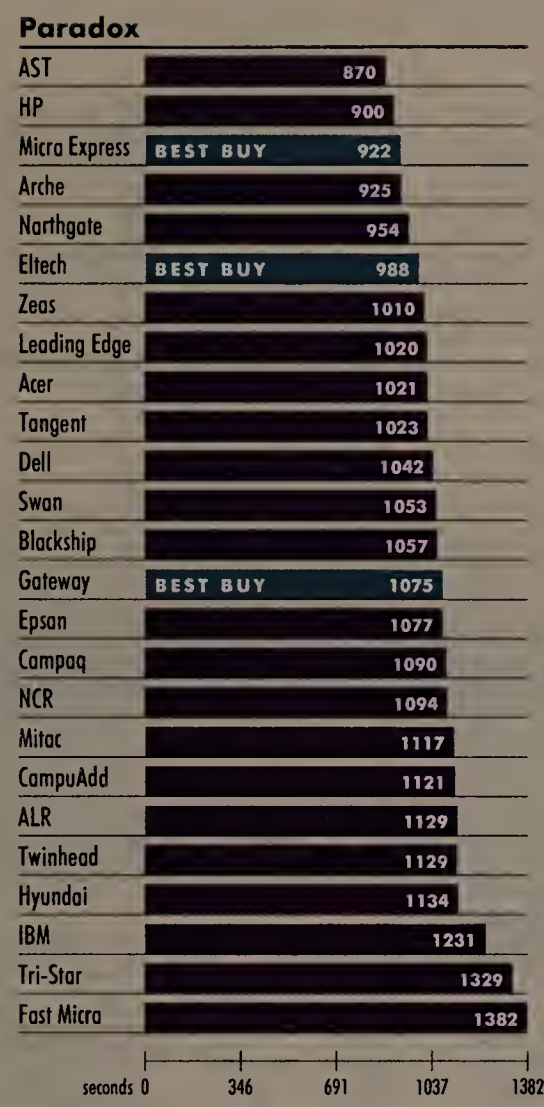
WHERE TO BUY

Acer 1120SX
Acer America Corp.
2641 Orchard Pkwy.
San Jose, CA 95134
800/733-2237,
408/922-0176 (fax)
LIST PRICE: 2MB RAM, 1.44MB or 1.2MB floppy, 800 by 600 VGA, one parallel, two serial ports, mouse port, keyboard $1495; same except 4MB RAM, 120MB hard disk, 1024 by 768 VGA and noninterlaced display $3014
ACCESSORIES: 2MB RAM $220; 200MB IDE hard disk $1195
Reader service no. 687

ALR PowerFlex 20SX
Advanced Logic Research, Inc.
9401 Jeronimo
Irvine, CA 92718
800/444-4257,
714/581-9240 (fax)
LIST PRICE: Model 40 with 1MB RAM, 1.44MB floppy, one parallel, one serial port, keyboard $1195; Model 80 same except 80MB hard disk, 5MB RAM, 800 by 600 VGA and color display $3242
ACCESSORIES: 4MB RAM $449; 14-inch super-VGA color display $699
Reader service no. 689

Arche Triumph 386SX-20
Arche Technologies, Inc.
48502 Kato Rd.
Fremont, CA 94538
800/437-1688,
510/683-8100
LIST PRICE: 2MB RAM, 1.2MB floppy, super VGA, one parallel, two serial ports, DOS $1830; same except 4MB RAM, 120MB hard disk, 1024 by 768 VGA and color display $3254
ACCESSORIES: 2MB RAM $200; 200MB IDE hard drive $999
Reader service no. 690

AST Premium II 386SX/20
AST Research, Inc.
16215 Alton Pkwy.
P.O. Box 19658
Irvine, CA 92713-9658
800/876-4278,
714/727-4141
LIST PRICE: 2MB RAM, 1.44MB floppy, super VGA, one parallel, two serial ports, mouse port, keyboard $1595; same except 4MB RAM, 210MB hard disk, super-VGA and color display, one parallel, two serial ports, mouse port, mouse, DOS 5.0 $3585
ACCESSORIES: 1MB RAM $100
Reader service no. 691



Methodology
We tested all the computers with 4MB RAM except the ALR PowerFlex 20SX and Twinhead Superset 590/20, which had 5MB RAM. The systems' hard disk size ranged from 80MB to 210MB. We used the vendor's version of DOS 5.0 or Microsoft DOS 5.0.

1-2-3
We load the application, followed by three separate worksheets (arithmetic, financial, and scientific). We make various changes and run recalcs on each. Finally, we use the *MAPS* add-in from Management Advisory Services of Seattle to run a number of financial forecasts.

WordPerfect
We reformat three *WordPerfect 5.1* documents that vary in size from 5K to 55K. The files are text with some boldface and underlining. One document includes a TIFF image.

Windows 3.0
Timing begins and ends at the DOS prompt. We launch *Windows* along with a macro that loads *Microsoft Excel* with a financial worksheet and initiates a recalc. Then the macro loads Lotus's *Ami Pro* along with a 50K document that contains a 500K TIFF image. Finally, the macro launches Micrografx Designer, opens a drawing, displays it on screen, and exits to DOS.

dBASE IV
With the caching feature enabled, we complete an unindexed search for a single record in a 100,000-record parts table. Then we index the table, run the transaction processing module, and post 600 records.

Paradox
Starting with an orders table, we compare each record with an available stock table. The application finds the current price for the items and inserts the resulting record into an invoice table.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

Blackship BLK 386SX/20
Blackship Computer Systems, Inc.
2031 O'Toole Ave.
San Jose, CA 95131
800/531-7447,
408/432-1443 (fax)
LIST PRICE: 2MB RAM, 32K cache, 1.2MB and 1.44MB floppies, 40MB hard disk, one parallel, two serial ports, keyboard, baby case, VGA and 14-inch color VGA display $1595; some except 4MB RAM, 130MB hard disk, super-VGA and color display $1995
ACCESSORIES: tower case $100; 1MB RAM $55; 1.2GB SCSI hard drive and controller $2425
Reader service no. 692

Compaq Deskpro 386s/20
Compaq Computer Corp.
P.O. Box 692000
Houston, TX 77269-2000
800/231-0900,
713/374-1740 (fax)
LIST PRICE: 2MB RAM, 1.44MB floppy, 60MB hard drive, one parallel, one serial port, mouse port, keyboard, VGA $2599; some except 4MB RAM, 120MB hard disk, color VGA display $4116
ACCESSORIES: 2MB RAM $319, 4MB $629; 210MB hard drive $1089
Reader service no. 693

CompuAdd 320sc
CompuAdd Corp.
12303 Technology Blvd.
Austin, TX 78727
800/627-1967,
512/335-6236 (fax)
LIST PRICE: 2MB RAM, 1.2MB floppy, 40MB hard disk, parallel, serial, game port, keyboard, super-VGA and color display, DOS 5.0 $1995; some except 4MB RAM, 120MB hard disk, 1024 by 768 VGA and color display, mouse $2490
ACCESSORIES: 2MB RAM $170; 1.44MB floppy $75
Reader service no. 694

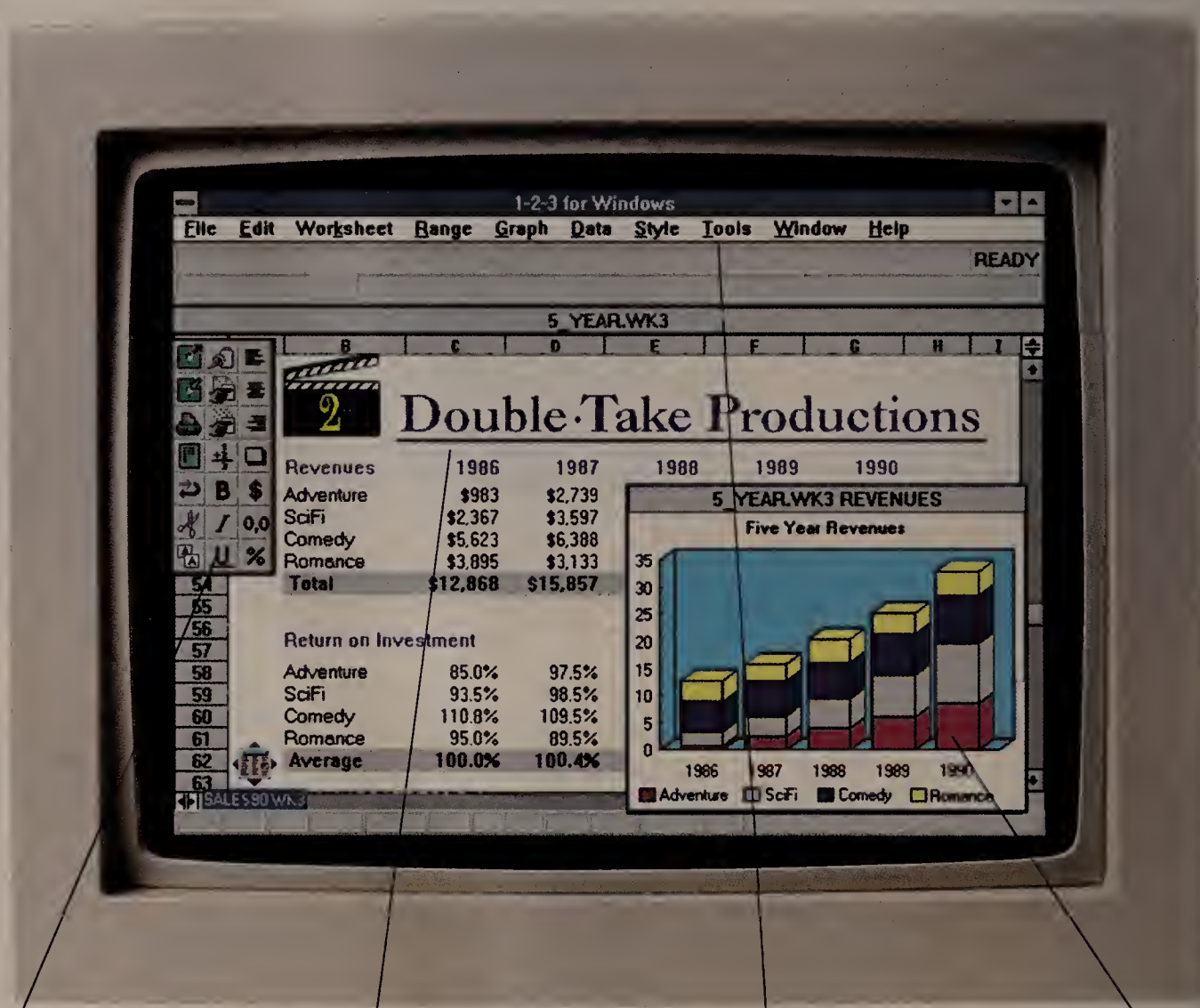
Dell System 320SX
Dell Computer
9505 Arboretum Blvd.
Austin, TX 78759-7299
800/289-3355,
512/338-8700 (fax)
LIST PRICE: 2MB RAM, 40MB hard disk, 1.2MB or 1.44MB floppy, VGA and color display, keyboard, one parallel, two serial ports, mouse port $1699; some except 4MB RAM, 1.2MB and 1.44MB floppies, 100MB hard disk, 800 by 600 VGA and color display

Pure Windows.

Introducing
Lotus 1-2-3 for Windows.
It's everything a Windows spreadsheet
was meant to be.

After listening carefully to what our customers were looking for in a Windows™ spreadsheet, we developed Lotus® 1-2-3® for Windows with three goals in mind.

First, make it a full-fledged Windows application. Second, introduce innovations that



Palette of customizable SmartIcons can be sized and placed anywhere on the screen.

Includes Adobe Type Manager® (ATM®), the leading scalable font manager, for outstanding spreadsheet publishing and presentations.

Feel right at home with our true Windows interface. With it, you can easily integrate spreadsheet data with other Windows applications.

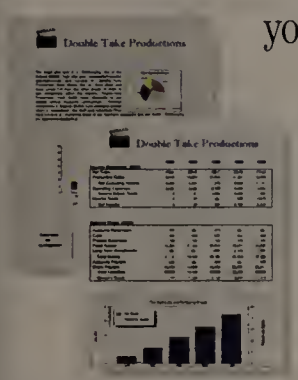
Interactive graph gallery lets you preview and select by example a wide range of chart and graph types.

ATM

Pure 1-2-3.

deliver a balance of power and simplicity. And third, make it fully compatible with the earlier versions of 1-2-3 that millions of users are familiar with.

Well, we've done all this and more. Which is no doubt why 1-2-3 for Windows was awarded Byte Magazine's *Best New Windows Application* at Comdex/Spring '91.

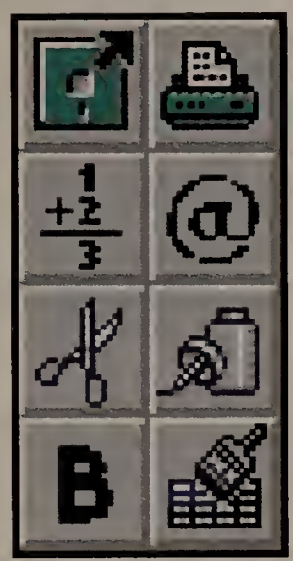


When you're ready to print, your results will be nothing short of perfection. And thanks to its Auto Compress feature, you can easily make an entire report fit on one page.

One of the first things you'll notice about 1-2-3 for Windows is its SmartIcons™—simple, one-click shortcuts to performing common spreadsheet tasks. For example, sum a row of numbers, make text bold, create a graph, save or print a file, even run a macro—all in a single step.

Unlike the Toolbar™ in Microsoft® Excel, 1-2-3 for Windows actually lets you create your own icons for the tasks that are unique to you.

And yes, 1-2-3 for Windows takes full advantage of the Windows environment, with pull-down menus, dialogue boxes, sizable windows, full DDE support and everything else you'd expect to find in Windows.



Customizable SmartIcons give you push-button access to basic and advanced spreadsheet functionality. Over 50 standard icons come with the program, or create new icons to suit your needs. For example, sum a column or a row, or change text to bold—all in a simple step.

What's more, with its interactive graph gallery, you can select by example a wide range of graph types, including true 3D. Altogether, over 200 different graph style combinations.

Finally, to make the move to Windows a simple one, we've included 1-2-3 Classic® commands in the program. At the push of the slash key, the 1-2-3 menu appears on the screen. So not only are all your existing files, styles, and macros compatible with 1-2-3 for Windows, but the familiar keystrokes are too.

So see why Lotus 1-2-3 for Windows is more than a great Windows spreadsheet.

It's everything you've been looking for in one.

And now upgrade your current version of 1-2-3 to 1-2-3 for Windows and get both 1-2-3 *and* Ami Pro™ 2.0, our award-winning word processor, for just $199* (a $645 value).

For a free auto demo, or to order your upgrade directly from Lotus,** call **1-800-TRADEUP, ext. 6418.**

1-2-3 for Windows

Lotus

*Suggested retail price. Offer expires 12/31/91.
**Please have your credit card and product package ready when you call. In Canada, call 1-800-668-1509.

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WHERE TO BUY

$2789
ACCESSORIES: 2MB RAM $199; 320MB hard disk $1399; 1024 by 768 color monitor $599
Reader service no. 695

Eltech Model 2200
Eltech
47266 Benicia St.
Fremont, CA 94538
800/358-8330,
510/438-0990
LIST PRICE: 2MB RAM, 1.2MB and 1.44MB floppies, 40MB hard disk, one parollel, two serial ports, VGA ond color disploy, keyboard, DOS 5.0, Windows 3.0, mouse $1599; same except 4MB RAM, 32K RAM cache, 120MB hard disk $1999
ACCESSORIES: 2MB RAM $120; 400MB IDE hard disk $1200
Reader service no. 696

Epson Equity 386SX/20 Plus
Epson America
20770 Madrona Ave.
Torrance, CA 90503
800/289-3776,
213/782-0770
LIST PRICE: 2MB RAM, 1.2MB or 1.44MB floppy, one parallel, one seriol port, mouse port, keyboard, VGA $1999; same except 4MB RAM, 1.44MB floppy, 100MB hard disk $3088
ACCESSORIES: 2MB RAM $289; 200MB IDE hord disk $1415; Extended VGA display $635
Reader service no. 697

Fast Micro FastData 386/SX-20c
Fast Micro
3655 E. La Salle St.
Phoenix, AZ 85040
800/441-3278,
602/437-2300 (fax)
LIST PRICE: 2MB RAM, 1.2MB and 1.44MB floppies, 80MB hard disk, one parallel, two serial ports, game port, keyboard, super-VGA and color display $1449; same except 4MB RAM, 100MB hard disk, 32K RAM cache, 1024 by 768 VGA and color display, mouse $1719
ACCESSORIES: 4MB RAM $240; 660MB ESDI hard drive and controller $1600
Reader service no. 698

Gateway 386SX/20c
Gateway 2000
610 Gateway Dr.
North Sioux City, SD 57049
800/523-2000,
605/232-2023 (fax)
LIST PRICE: 2MB RAM, 1.2MB floppy, 80MB hard drive, 32K RAM cache, one parallel, two serial ports, mouse port, mouse, programmable 124-key keyboard, DOS 5.0, Windows 3.0, 14-inch 1024 by 768 VGA and color display $1745; same except 4MB RAM, 1.44MB and 1.2MB floppies, mouse $1895
ACCESSORIES: 2MB RAM $100; 200MB IDE hard drive $350
Reader service no. 699

HP Vectra 386/20N
Hewlett-Packard
19310 Pruneridge Ave.
Cupertino, CA 95014
800/752-0900,
408/865-6860 (fax)
LIST PRICE: 2MB RAM, 1.44MB floppy, 52MB hard drive, one parallel, two serial ports, mouse port, keyboard, super-VGA $2699; same except 4MB RAM, 1.2MB and 1.44MB floppies, 120MB hard drive, 1024 by 768 VGA and noninterlaced color display, mouse $4216
ACCESSORIES: 2MB RAM $440; Ergonomic Super VGA monitor $899
Reader service no. 700

Hyundai Super-386STc
Hyundai Electronics America
166 Baypointe Pkwy.
San Jose, CA 95134
800/727-6972,
408/473-9200
LIST PRICE: 2MB RAM, 1.2MB floppy, 40MB IDE hard disk, one parollel, two serial ports, keyboard $2625; same except 4MB RAM, 1.2MB and 1.44MB floppies, 100MB hard disk, VGA and color disploy, mouse $3355
ACCESSORIES: 2MB RAM $230; 200MB IDE hard drive $1500
Reader service no. 701

IBM PS/2 Model 57 SX-049
IBM
Old Orchard Rd.
Armonk, NY 10504
800/426-9292
LIST PRICE: Model 57 SX-045 with 4MB RAM, 2.88MB floppy, 80MB SCSI hard disk with external controller, one parollel, one serial port, mouse port, keyboard, 1024 by 768 VGA $3625; Model 57 SX-049 same except 160MB SCSI hard disk, 1024 by 768 VGA and color display, mouse $5255
ACCESSORIES: 4MB RAM $495, 8MB $1135; 2.88MB floppy $325; 80MB SCSI hard disk $1060
Reader service no. 702

Leading Edge D3/SX-20c
Leoding Edge Products, Inc.
117 Flanders Rd.
Westborough, MA 01581
800/874-3340,
508/836-4800
LIST PRICE: 2MB RAM, 1.2MB floppy, one parallel, one serial port, mouse port, keyboard, 1024 by 768 VGA, Windows 3.0, Microsoft Works for Windows, mouse $1459; same except 4MB RAM, 1.2MB and 1.44MB floppies, 130MB hard disk, 1024 by 768 VGA and color display $2779
ACCESSORIES: 2MB RAM $299; 210MB IDE hard disk $1299
Reader service no. 703

Micro Express ME 386SX/SL/20
Micro Express
1801 Carnegie Ave.
Santo Ano, CA 92705
800/989-9900,
714/852-1400 (fax)
LIST PRICE: 4MB RAM, 1.2MB floppy, 32K coche, keyboard, one parallel, two serial ports $599; some except 1.2MB or 1.44MB floppy, 120MB hard disk, 1024 by 768 VGA and color display $1849
ACCESSORIES: 2MB RAM $200; 1024 by 768 VGA and color display $440; 1.2GB SCSI hard disk and controller $2600; keyboard with built-in trockball $65
Reader service no. 704

Mitac MPC 2386E
American Mitac Corp.
410 E. Plumeria Dr.
San Jose, CA 95134
800/648-2287,
408/432-8519 (fax)
LIST PRICE: 1MB RAM, 1.44MB or 1.2MB floppy, 800 by 600 VGA, one parollel, two seriol ports, keyboord, DOS 4.01 $1495; same except 4MB RAM, 200MB hard disk, 800 by 600 VGA ond color display, mouse, DOS 4.01 $2370
ACCESSORIES: 1MB RAM $80
Reader service no. 688

NCR PC386sx/20
NCR Corp.
1700 S. Patterson Blvd.
Dayton, OH 45479
513/445-5000,
513/445-2008 (fox)
LIST PRICE: 2MB RAM, 1.44MB floppy, 44MB SCSI hard disk with external controller, porollel, serial, mouse port, keyboord, 1024 by 768 VGA and color display $3790; some except 4MB RAM, 200MB SCSI hard disk with external controller $5750
ACCESSORIES: 8MB RAM $1080; 100MB SCSI hord disk $800
Reader service no. 705

Northgate SlimLine 386
Northgate Computer
7075 Flying Cloud Dr.
Eden Prairie, MN 55344
800/548-1993,
612/943-8338 (fox)
LIST PRICE: 1MB RAM, 1.2MB or 144MB floppy, 52MB hard disk, one porallel, two seriol ports, keyboard, 1024 by 768 VGA ond color display, DOS 5.0 $1999; same except 4MB RAM, 210MB hard disk, Windows 3.0,

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mouse $2899
ACCESSORIES: 2MB RAM $240
Reader service no. 706

Swan 386SX/20
Swan Technologies
3075 Research Dr.
State College, PA 16801
800/468-9044, 814/237-4450 (fax)
LIST PRICE: 2MB RAM, 1.2MB and 1.44MB floppies, 50MB hard disk, one parallel, two serial ports, keyboard, 1024 by 768 VGA with 1MB RAM and color display, mouse, Windows, DOS $1995; same except 4MB RAM, 100MB hard disk $2195
ACCESSORIES: 2MB RAM $190; 200MB IDE hard disk $500
Reader service no. 707

Tangent 320S
Tangent Computer, Inc.
197 Airport Blvd.
Burlingame, CA 94010
800/223-6677, 415/342-9380 (fax)
LIST PRICE: 1MB RAM, 1.2MB or 1.44MB floppy, 52MB hard disk, one parallel, two serial ports, game port, keyboard, 1024 by 768 VGA, DOS 5.0 $1250; same except 4MB RAM, 120MB hard disk, 1024 by 768 VGA and color display, mouse, $2064
ACCESSORIES: 2MB RAM $160; 340MB IDE hard disk and controller $750; tower case $150; 1024 by 768 color VGA display $395
Reader service no. 708

Tri-Star 386SX 20
Tri-Star Computer Corp.
120 S. Weber Dr.
Chandler, AZ 85226
800/678-2799, 602/961-3401
LIST PRICE: 2MB RAM, 1.2MB and 1.44MB floppies, 80MB hard disk, one parallel, two serial ports, game port, keyboard, 1024 by 768 VGA and noninterlaced color display $1595; same except 4MB RAM, 130MB hard disk, Windows 3.0, mouse $2024
ACCESSORIES: 2MB RAM $110; RAM expansion card $195
Reader service no. 709

Twinhead Superset 590/20
Twinhead Corp.
1537 Centre Pointe Dr.
Milpitas, CA 95035
800/545-8946, 408/945-1080 (fax)
LIST PRICE: 1MB RAM, 1.2MB or 1.44MB floppy, one parallel, two serial ports, 1024 by 768 VGA $1199; same except 4MB RAM, 100MB hard disk, 1024 by 768 VGA and color display, mouse $2668
ACCESSORIES: mouse $50; 200MB IDE hard disk $900; noninterlaced color VGA display $429
Reader service no. 710

Zeos 386SX/20
Zeos Int'l, Ltd.
530 5th Ave. NW
St. Paul, MN 55112
800/423-5891, 612/633-1325 (fax)
LIST PRICE: 1MB RAM, 1.2MB or 1.44MB floppy, 42MB hard disk, one parallel, two serial ports, game port, keyboard, VGA and monochrome display, DOS 5.0 $1395; same except 4MB RAM, 130MB hard drive, 1024 by 768 VGA with 1MB RAM and color display, Windows 3.0, Ami Pro, 1-2-3 for Windows and mouse $2295
ACCESSORIES: 2MB RAM $165; 1.1GB internal SCSI hard drive and controller $2995
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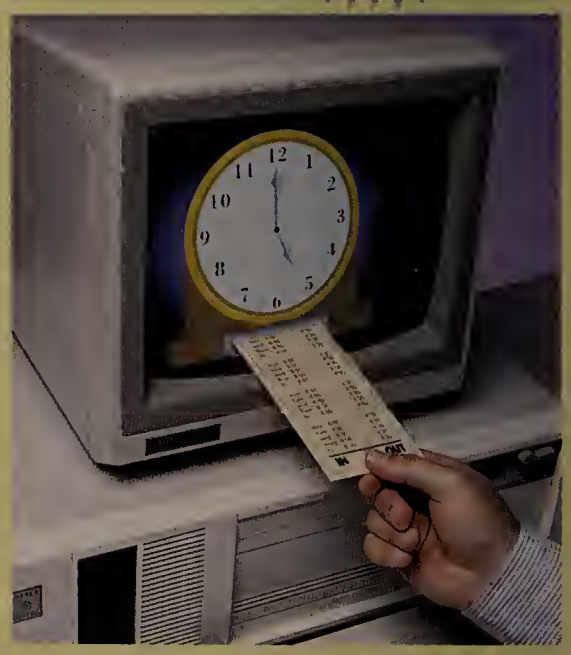

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To Illustrate The Northgate

Take a behind-the-scenes look at Northgate quality.

It's no secret that Northgate makes some of today's finest computer systems. A room full of awards from major industry publications is proof of that. But the tour you're about to take will show you *how* Northgate achieved its worldwide reputation for quality.

The reason we're "going public" with this information is simple. People who already own a Northgate system know from experience that we make no compromises on quality. Now we want the rest of the world to know about the qualities that made Northgate a leading direct marketer of high-quality systems.

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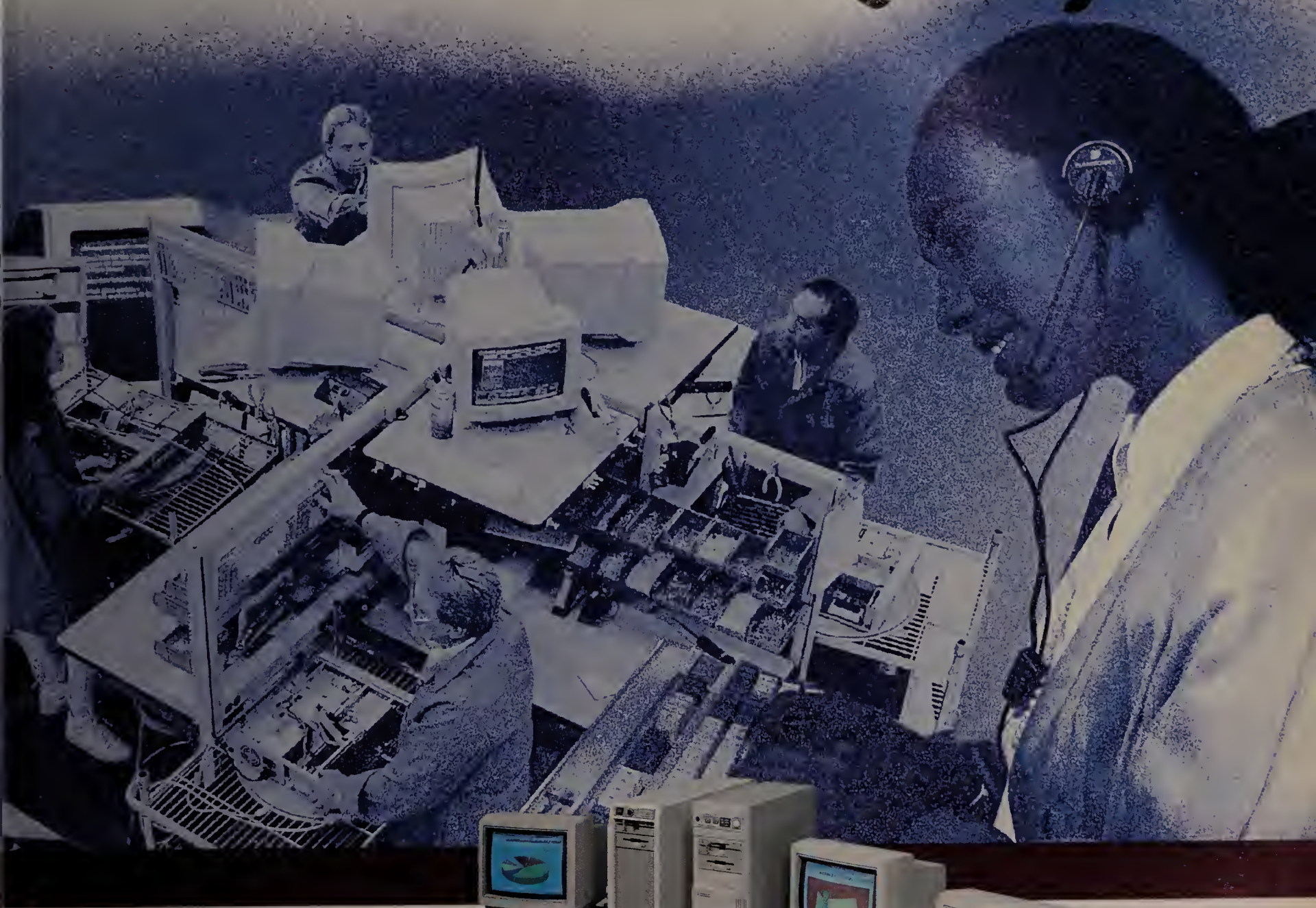

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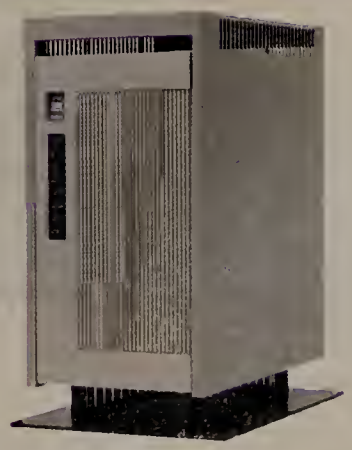

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No-Sweat Desktop Publishing

If you want your documents to stand out, but you're short on time, one of these five low-cost desktop publishing programs may be just what you need.

Deke McClelland

Every report, newsletter, and flier that leaves your desk is ultimately headed for a common destination: the trash can. But there's no reason it has to arrive there prematurely. An eye-catching layout with the right fonts and graphics can delay your document's journey long enough to do you some good.

If page design isn't part of your job description but you sometimes need to seize the attention of your colleagues and clients with a flashy newsletter, brochure, or fax, a no-frills desktop publishing program may be just what you need. With one of the five affordable packages reviewed here, you can assemble text and graphics from other applications into professional-looking documents.

With list prices ranging from $130 to $250, these programs are practically impulse buys—substantially cheaper than leading desktop publishing applications and full-featured word processors. They also need considerably less horsepower. *Ventura Publisher* and *PageMaker* each require 3MB of RAM or more, huge chunks of disk space, and a 386 system or better to perform reliably. None of the programs reviewed here—

even the two *Windows* packages—require more than 1MB of RAM or 3.2MB of disk space.

Small Is Beautiful

One of these publishing packages is a real standout. Thanks to a streamlined interface, exceptional templates and utilities, and the best font handling of the bunch, *Microsoft Publisher* measures up as the year's Best Buy.

Not that we'd recommend *Microsoft Publisher*, or any of the other programs here, to a professional designer. For example, none of these programs number figures automatically or generate tables as *Ventura Publisher* can. Nor can they handle text and graphics with *PageMaker*'s precision. But if publishing that perfect four-page mailer is only a small part of your job, you're probably better off without the complexities of a full-blown page composition package.

At the other end of the power spectrum, you could lay out pages with a good word processor. There are compromises here, especially if your word processor is text-based. You can lay out multiple columns, drop in graphics, and even insert boxed text with programs such as *WordPerfect* and *Microsoft Word*, but you can't do it easily. If you're usually happy with your text-based word processor, an inexpensive desktop publishing program can make

Buying Smart: Critical Criteria for the Bargain Publisher

A good desktop publisher helps you set guidelines for consistent-looking pages, then makes it easy for you to break the rules and give each page a unique appearance. You should be able to take words and pictures from any other program and alter them to your heart's content. What should you look for? Here's a quick guide.

EASE OF USE

In theory, all desktop publishing should be easy—after all, you're doing little more than moving blocks around an electronic mock-up of your page—but it often isn't. Excessively slow screen rewrites, limitations on mouse movement, menus within menus within menus, and separate utilities for jobs that should be part of the main program all conspire to make some packages more work than they should be.

On the other hand, a well-designed desktop publisher can be a joy to use. Templates (which offer guidelines for common types of documents), readily available on-screen buttons for common tasks, and tool palettes that float—move from one part of the screen to another—all remind you that graphic user interfaces exist to make your life easier.

PAGE DESIGN AND LAYOUT

Styles and style sheets help you apply the same formatting to the same type of paragraph. For instance, by assigning each headline the same style, you can quickly give them all the same font, spacing, and other attributes. Master pages contain elements like page numbers, logos, and rules that repeat from one page to the next. Automatic headers and footers, while not as versatile as master pages, are often easier to use and do part of the same work.

If you're creating a newsletter or other multipage document, you'll want your text to flow from one frame to another as easily as it would between columns in a word processor. When your text fills all the frames, it should automatically create new frames and, if necessary, new pages. If you can link frames manually, your text can flow from one to another regardless of their positions on the page. But what happens once the text has flowed? If the frames don't remain linked, you'll have to do some clumsy cutting and pasting every time you edit your text or resize a frame.

Snap-to guides are nonprinting lines that help position text and other elements exactly. The most important are column guides, which subdivide a page to create evenly spaced text frames. Ruler guides pop out from the horizontal and vertical rulers to help align headlines and graphics.

Look also for auto-scrolling, which scrolls the screen when you move your cursor off it, so you can extend elements beyond the boundaries of the window. And to get the big (and little) picture, you'll want at least six view magnifications, including an overview of a two-page spread. A pasteboard is a helpful holding area that lets you park elements for later use.

FONT HANDLING

What's desktop publishing without a variety of fonts to spice up your documents? First of all, you'll need scalable fonts—typefaces that you can shrink or expand to a wide range of sizes without distorting—to make text just the size you want. If you like the fonts you already own, in the PostScript printer, a font cartridge, or a soft font collection, you'll want a program that supports them.

Fonts are measured vertically in points, with 72 points to an inch. You'll want the ability to make your

page layout easier without forcing you to change your work habits.

Of course, *Windows* word processors like *Ami Pro* and *Word for Windows* also let you point and click on a screen that looks like the printed page. But even the best of them can't match the layout power of a low-end desktop publisher. For instance, most desktop publishing programs let you place text into rectangular objects called *frames*, which you can resize and move at will. Most *Windows* word processors now support frames, but few let you flow text easily from one frame to another or use snap-to grids to align text and graphics precisely. Even fewer let you do more with your fonts than resize them. On the other hand, most of these publishing packages let you twist, turn, and otherwise distort your letters, giving you the control you need when you create fliers and advertising copy.

Control, after all, is the name of the game here—control over text, graphics, and the overall page. And the more easily you can control your documents, the longer it will be before they land in the dumpster.

Deke McClelland is the author of Drawing on the PC *(Business One Irwin, Homewood, Illinois, 1990).*

For more information on all products in this article, circle reader service no. 901.

fonts very big and very small, and you'll want to be able to scale your font by a fraction of a point. For more sophisticated copy fitting, you'll need tracking and kerning capabilities, which adjust space between letters, and adjustable interword spacing.

For documents that make your readers sit up and take notice, look for a program that lets you condense and expand type by scaling a character's width, rotate text 360 degrees in 1-degree increments, skew text to slant letters forward or backward, and print text on a curve. Automatic pop and drop caps that extend above or below a line make it easy to draw the eye to the start of a story.

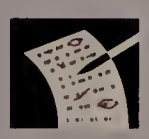
GRAPHICS HANDLING

You probably won't need the Mona Lisa in your annual report, but you'll want to create simple drawings or import and edit graphics. All five programs provide tools for drawing straight lines, rectangles, and ovals, and most let you create perfect squares and circles. If you need more variety—say, the occasional triangle—you'll want polygon and freehand curve tools.

Look for a program that lets you customize a line's thickness, or *weight,* as well as your line and fill patterns. If you plan to label illustrations, add automatic arrowheads to your shopping list. Gradients, which blend the interior of a shape from one fill pattern to another, lend an air of sophistication.

If drawing tools are important, you'll also need to be able to edit points in an object by moving them and changing the curvature of the segments between points. The ability to select multiple objects lets you move, as well as apply these weights and fills to, several items at a time, while grouping objects binds them together for future manipulation.

Your graphics will probably come from another program. All the packages can read graphic files in a variety of popular formats, and they all come with good-sized collections of clip art. But programs that let you edit imported images have a decided advantage, as do those that handle gray-scale or color images.



EDITING TOOLS

If you want to write and edit text, use a word processor. All the programs reviewed here accept files from WordPerfect, Microsoft Word, and WordStar. But editing tools still come in handy for last-minute changes. Tabs and leader dots (used to put a line of periods between a chapter title and a page number, for example) are essential if you plan to create tables. Paragraph spacing and indenting tools come in handy, as do various page-numbering options. All the packages offer discretionary hyphens, but also look for automatic hyphenation.

PRICE

At $130 to $250 retail, each of these programs qualifies as a bargain; and on the street you can find them about $50 to $100 cheaper than that. In comparison, both PageMaker and Ventura Publisher list for $795 and sell for about $500 on the street.

TECHNICAL SUPPORT

Even with an easy-to-use desktop publisher, you may need a helping hand. To test technical support, we called each vendor three times, asked questions of varying technical complexity, and noted the timeliness and accuracy of their answers. We also factored in their support policies, such as hours, toll-free lines, and BBS and fax support.

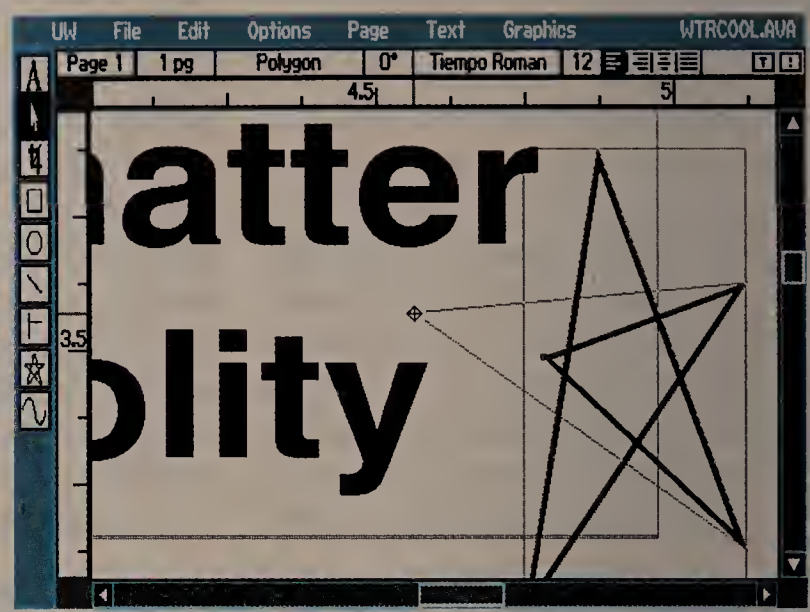
Avagio 2.0

PROS: Strong drawing ond graphics tools
CONS: Slow screen refresh, no PostScript support, unresponsive tech support

If you want to adorn your documents with a healthy dose of graphics, *Avagio* is worth considering—no other program reviewed here matches its ability to create, integrate, and enhance images. But *Avagio* rewrites your screen slowly and often, making editing difficult, and its font support is the weakest in the roundup.

Avagio is the only program we looked at that lets you edit a graphic's object points, so you can reshape a drawing without redoing it from scratch. You can also group objects in order to manipulate them as a single entity. For example, when drawing a logo, you may want to design the text separately from the image, but you'll want to move the ensemble together. *Avagio* is equally adept at coloring and shading graphics—you can mix the fill pattern of one object with the pattern of the object directly behind it to achieve a nice blending effect.

But handling text will try your patience. If you change so much as a single character using *Avagio*'s editing tools, the entire story reformats on screen, one line at a time, and very slowly—even if your change doesn't affect any line but the one you made it on. If a page has more than a few lines of text in it, this flaw makes text editing downright painful.



Avagio is the only program reviewed here that lets you edit an object by moving its points to new locations.

What's more, Unison World has the worst technical support in the roundup; getting help can be a major challenge. Of three test calls we made, one was returned after 5 hours, another was returned two days later, and the third was never returned.

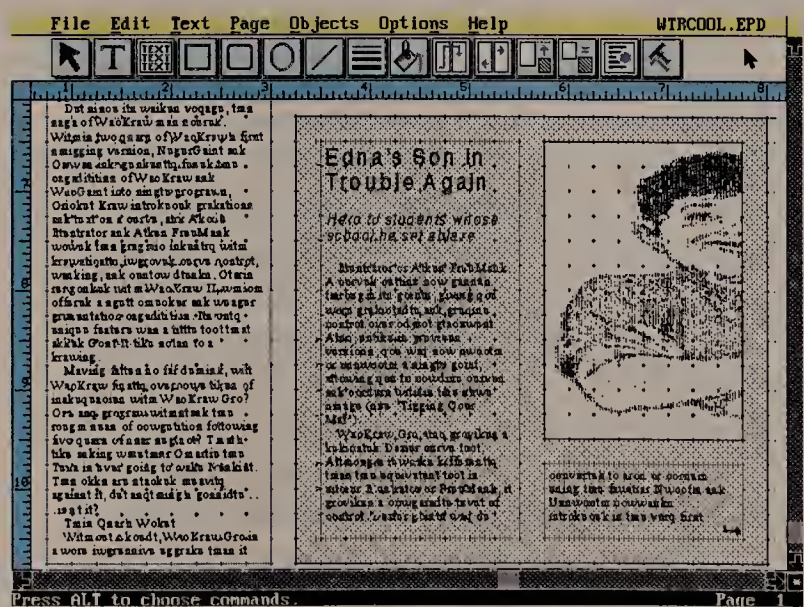
Avagio is a possibility if you're making advertising fliers that are long on graphics and short on text. Otherwise, keep looking.

Express Publisher 2.03

PROS: Foncy font work, outo-scroll
CONS: Difficult interface, no guides

The good news is, by the time you read this review, Power Up Software should be shipping a hot new *Windows* version of *Express Publisher* that looks like a real contender. The bad news is, DOS users aren't so blessed—the DOS version of *Express Publisher* makes it far too difficult to design a page. Even where the program boasts a rich feature set—special font effects, for example—there's always some roadblock lurking about that keeps you from getting your work done quickly.

Laying out a page in *Express Publisher* is a real challenge. First, instead of the movable guidelines that other programs use to help align elements, *Express* offers stationary grids that aren't guaranteed to be exactly where you want them. Second, you can't easily format a paragraph in a unique way; you must either separate it into its own frame, or give it a different style. Finally, you can't view a full page and work on it at the same time; you must magnify part of your screen to make adjustments—even if what you're adjusting is a large frame that takes up most of the page.



Express Publisher crops gray-scale PCX images as it imports them, giving you only half a picture if you want.

Express Publisher does have its moments—when you move the mouse cursor off the screen, the image scrolls with it automatically. And when it comes to twisting and turning normal text into something more exotic, *Express Publisher* is the best of the bunch. You can rotate and skew text in 1-degree increments and print text on a curve. Still, even when you're using the capable tools, the interface gets in your way—you have to create your great-looking text effect outside your document, save the effect as a separate file, and then import it.

Windows users may want to check out the upcoming version of *Express Publisher*, but if you prefer DOS you'd do better to look elsewhere.

Better Windows

Solve memory problems
QEMM 386 makes the most of every last 'K'. DESQview uses that memory to run multiple programs.

Multitask
Run multiple programs side-by-side in windows. 'Background' programs can continue to run.

See text and graphics side-by-side
Reference information in your graphics program while writing your report.

Run Windows programs
DESQview even lets you run Microsoft Windows.

Easy menu access to programs and DOS services
Access programs or DOS in a window with just a few keystrokes or mouse clicks. It's that simple.

See multiple files
If your programs allow it, DESQview lets you run the same program in two or more windows. Great for comparing files

Cut and paste data
Transfer data between programs with a few keystrokes.

Handle large programs
Run standard DOS programs side-by-side with DOS-extended programs like 1-2-3 Release 3.

DESQview. The Multitasking, Windowing Environment.

Once the power user's secret, DESQview has been discovered by computer knowledgeable people everywhere. Over 1,000,000 people have bought DESQview.

INFO WORLD Product of the Year 1986, 1987, 1988, 1989 · PC WORLD BEST BUY · PC MAGAZINE EDITORS' CHOICE · PC MAGAZINE EDITORS' CHOICE · PC MAGAZINE EDITORS' CHOICE · PCComputing MVP MOST VALUABLE PRODUCT 1990

Multitasking; windowing, using keyboard or mouse commands, it's all easy with DESQview.

DESQview 386 2.3 lets you use your favorite DOS and DOS-extended programs in windows side-by-side on 386SX, 80386 and i486 PCs. As you can see above, you can even run Microsoft Windows within DESQview.

DESQview 2.3 gives 8088, 8086 and 286 PCs with additional memory most of the same capabilities with surprisingly little performance trade-off.

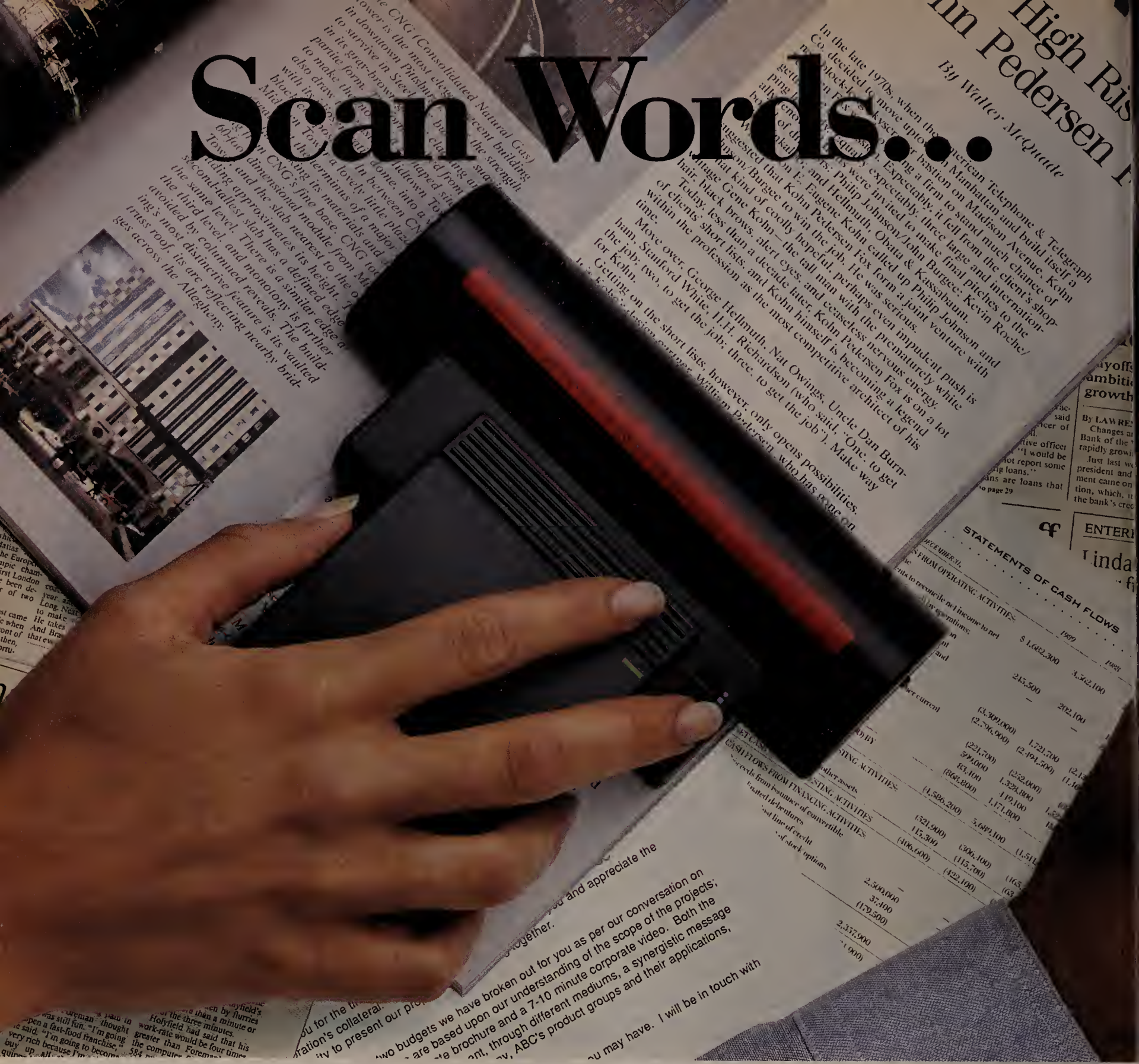
Whatever programs you use—DOS, extended DOS or Windows—and whatever hardware you have, whether 8088 or i486 or something in between, DESQview is still the best way to get the most out of the hardware and software you own today.

DESQview. When you look into it, it's the obvious choice.

Quarterdeck

Quarterdeck Office Systems, 150 Pico Boulevard, Santa Monica, CA 90405 (213) 392-9851 Fax (213) 399-3802

Scan Words...



TYPIST

PLUS GRAPHICS

Everyone agrees that the *Typist*™ is the best thing that ever happened to hand scanners. The ability to read words and numbers easily and accurately really makes a difference when you're pressed for time. Or like most people you simply hate to type.

With the *Typist* you can scan almost any document just like you were typing it yourself; into just about any PC compatible or Macintosh® word processor, spreadsheet or database.

It's not surprising then that the *Typist* has so quickly become the hand scanner of choice when it comes to OCR. The clear standard.

So you might say that the writing was already on the wall, and it was only a matter of time before the *Typist* allowed you to scan and edit graphics as well.

That's why Caere® Corporation created the *Typist Plus Graphics*™, the hand scanner that adds yet another dimension by allowing you to scan and enhance photos, artwork and illustrations with incredible ease and accuracy.

The *Typist Plus Graphics* lets you put your best image forward because of a major innovation called the *Graphic Editor*™, which creates full tone images – 256 shades of gray – in software. You can display grayscale images up to the full capacity of your screen; modify and edit in either grayscale mode for photographs, or black and white mode for line drawings; and later output in picture perfect form.

In fact, when it comes to printed output, the *Typist Plus* includes *LaserGray*™, yet another proprietary technology from Caere. So you can print halftones that look just like grayscale images. The photos that

Now Graphics.

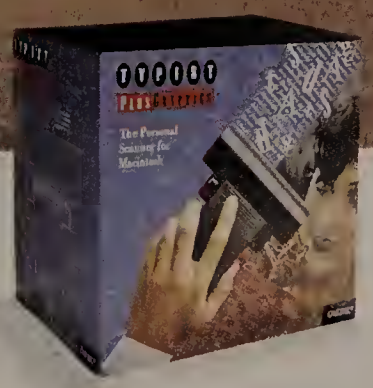
you modify on-screen have a crisp, sharper look and feel. A professional touch.

Just think of what the addition of picture perfect graphics can mean for your business or profession.

Use the *Typist Plus Graphics* to capture photos that you can incorporate into your most critical business presentations or reports. Scan company logos and place directly onto your stationary, invoices or slide presentations. You can add graphics to all of your Macintosh desktop published documents, including training manuals, newsletters – even invitations to company events.

The word is out about the *Typist Plus Graphics*. Now you get the full picture – words and graphics – in one intuitive and easy-to-use hand scanner.

To learn more about the *Typist Plus Graphics* and how it can be of assistance to you, contact one of Caere's authorized dealers. Caere, the Complete Recognition Company.



For more information:

Call: 1-800-535-SCAN

Write: Caere Corporation
100 Cooper Court
Los Gatos, CA 95030

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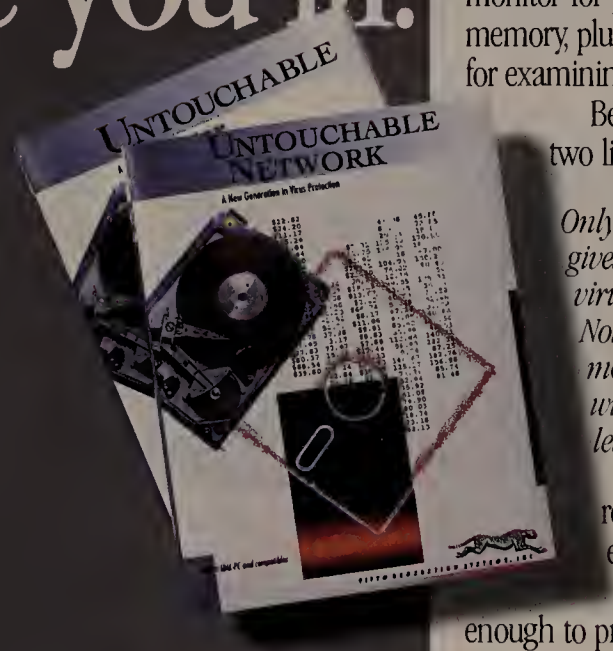
Circle 21 on reader service card

Paying again and again for virus protection is enough to make you ill.



Frankly, paying anything at all is pretty nauseating.

But that's nothing compared to the feeling you get in your stomach when a drive full of data goes down the drain.

So you pay.

Then you pay again. For upgrades. Or quarterly "updates."

But even that doesn't buy you much peace of mind. Because each new day brings an average of six new viruses into the world.

Which means all anti-virus programs are inherently obsolete.

Except one.

Introducing Untouchable.™ The only software in the world that gives you 100% protection.

Today.

And tomorrow.

Like other anti-virus software, Untouchable is equipped with a TSR monitor for patroling your system memory, plus a scanner/remover for examining the files on your disk.

Between them, these first two lines of defense can recognize and obliterate hundreds of the little buggers — enough to protect you from 95% of the potential carnage.

Only Untouchable Network gives you centralized virus protection. Now you can install, monitor and control without having to leave your seat.

If you find that statistic reassuring, then you probably like the odds in Russian Roulette.

If you don't, you'll want to know that Untouchable is equipped with a unique *third* line of defense, which has been mathematically proven to be, well, untouchable.

Instead of looking for viruses, this third line of defense looks for *changes in your executable and system files.*

If the change is but a single byte, Untouchable will spot it and, using our patent-pending recovery technique, reconstruct the file to its original state.

The process is known as Generic Differential Detection, and certain other programs claim to perform it, too.

But only Untouchable calculates file signatures using not one, but two proprietary algorithms that can't be reverse-engineered.

Only Untouchable guarantees 100% safe recovery of infected files. (Unlike other programs that proudly generate corrupted files, Untouchable knows when the jig is up and doesn't attempt recovery.)

Only Untouchable can provide centralized network virus protection. In fact, Untouchable Network has enough virus alerts and reporting mechanisms to settle the stomach of even the most nervous Netware® administrator.

And only Untouchable is backed by our vaunted 24-hour toll-free technical support and a one-year money-back guarantee.

If you're worried about viruses — and you should be — don't reach for the Maalox.® Reach for the phone. Dial 1-800-388-0362.

You'll feel better right away.

FIFTH GENERATION SYSTEMS, INC

Circle 71 on reader service card

FEATURES EVALUATION

Ingredients for a Great-Looking Page

Best Buy Microsoft Publisher has the top tools for page layout and text handling—both for editing text and printing it in great-looking fonts. In graphics, however, Avagio leads.

● Yes
○ No
◒ Deficient

	Avagio 2.0 2.03	Express Publisher 1.0 W	Microsoft Publisher 1.1 W	Pageplus 2.0	Publish-It [1]
Standard features					
Price	$149.95	$129.95	$199	$149	$249.95
RAM required	1MB	640K	1MB	1MB	640K
Minimum hard disk space (MB)	2.9	3	3	3.2	1
Page design and layout					
Style sheets	●	●	●	◒[2]	●
Master pages	●	○	●	◒[3]	●
Automatic header/footer	○	●	●	○	●
Automatic frame and page generation	●	◒[4]	●	○	◒[4]
Manual frame linking/ frames remain linked	●	●	●	○	●
Snap-to column guides	●	○	●	●	●
Snap-to ruler guides	●	○	●	●	○
Pasteboard	○	○	●	●	○
Auto-scroll	○	●	●	○	○
Number of view sizes	6	4	7	200	6
Facing pages view	◒[5]	●	●	●	●
Font handling					
Typefaces included	30	8	31	71	17
Font size range (points)	4–500	6–144	0.5–500	4–250	3–250
Scalable fonts	●	●	●	●	◒[6]
Supports resident printer fonts	○	●	●	○	●
Supports PostScript output	○	●	●	●	●
Supports Fontware or Facelift	○	◒[7]	●	○	◒[7]
Fractional point sizes	○	○	●	●	○
Tracking	○	○	●	●	●
Manual kerning	●	○	◒[8]	●	●
Condense and expand type on the fly	●	●	●	●	◒[6]
Rotate text block	●	●	◒[9]	●	○
Skew text block	○	●	◒[9]	●	○
Print text on a curve	●	●	●	○	○
Automatic pop/drop caps	○	○	●	○	○
			BEST BUY		

	Avagio 2.0 2.03	Express Publisher 1.0 W	Microsoft Publisher 1.1 W	Pageplus 2.0	Publish-It [1]
Graphics handling					
Circles/squares	●	○	●	●	●
Polygons/freehand curves	●	◒[10]	●	○	●
Line weights	●	◒[11]	●	●	◒[11]
Line patterns	●	○	◒[11]	●	◒[11]
Arrowheads	●	○	●	○	●
Fill patterns	●	◒[11]	◒[11]	●	◒[11]
Gradients	●	○	●	○	○
Edit object points	●	○	●	○	○
Select multiple objects	●	◒[12]	◒[12]	●	○
Group/ungroup objects	●	○	●	○	○
Edit imported image	○	●	●	○	●
Print gray-scale and color images	●	○	●	●	○
Editing tools					
Spelling checker	○	○	●	○	○
Global search and replace	●	●	●	○	●
Paragraph spacing/ indents	●	◒[13]	●	○	◒[14]
Tabs	●	◒[15]	●	○	●
Dot leaders	●	○	●	○	●
Arabic page numbers	●	●	●	○	●
Roman page numbers	○	●	●	○	●
Alphabetical page numeration	○	●	●	○	●
Automatic hyphenation	●	●	●	○	●
Service and support					
Daily support (hours)	9	9	12	6	8
Unlimited free support	●	●	●	○	●
Toll-free number	●	○	●	○	◒[7]
Weekend support	○	○	●	○	○
BBS support	●	○	●	●	●
Fax support	●	●	●	●	●
Additional services at extra cost	●	○	●	●	●
			BEST BUY		

W Windows product.
[1] Publish-It 1.13 won a Best Buy in August 1990.
[2] Must copy and paste styles between blocks.
[3] Affects only new pages.
[4] Must create sample frames first.
[5] Can't edit in facing pages mode.
[6] Must do in separate utility.
[7] Extra-cost option.
[8] No kerning preview.
[9] Can't be applied in single-degree increments.
[10] Can create only regular polygons in special effect area.
[11] Can't customize.
[12] Can't apply attributes to multiple selected objects.
[13] Can't apply to individual paragraphs.
[14] Before-paragraph spacing only.
[15] No right or center tabs.

THE MOST POWER

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FUL 486SX. GOING.

Behold the new Toshiba T4400SX notebook—the first 486SX computer to offer all the power and performance of a desktop computer while freeing you from the tyranny of the nearest electrical outlet.

For starters, the T4400SX offers a 25 MHz 486SX microprocessor with 8K internal cache, upgradable to a full 486DX. Plus an 80 MB hard drive and standard 2 MB RAM, expandable to 10 MB.

You can use our credit card-sized memory modules to expand standard 2MB RAM to 10MB for added speed and multi-tasking capabilities.

The T4400SX is the only notebook computer that offers a high-speed Gas Plasma screen, which means no mouse blur. And its 100:1 contrast ratio delivers seven times the contrast of a typical LCD display.

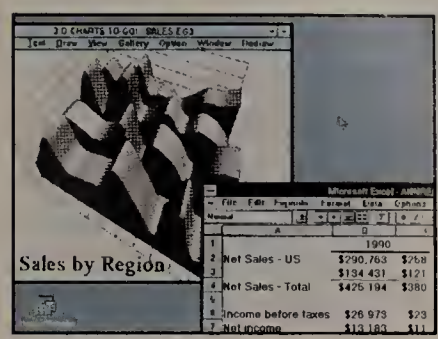
Or if you prefer, you can choose our 9.5" diagonal LCD display, the most state-of-the-art LCD available, with uncompromising clarity from the black and white ultra thin screen.

Both offer a 640 x 480 VGA high-resolution display as well as the graphic versatility of 16 gray scales for the gas plasma screen and 64 gray scales for the LCD screen.

For familiarity and ease of use, the T4400SX has a full-function keyboard with standard size keys and key spacing.

The Nickel Cadmium battery provides more than three hours of computing power. Our AutoResume feature allows you to shut down and start up precisely where you left off.

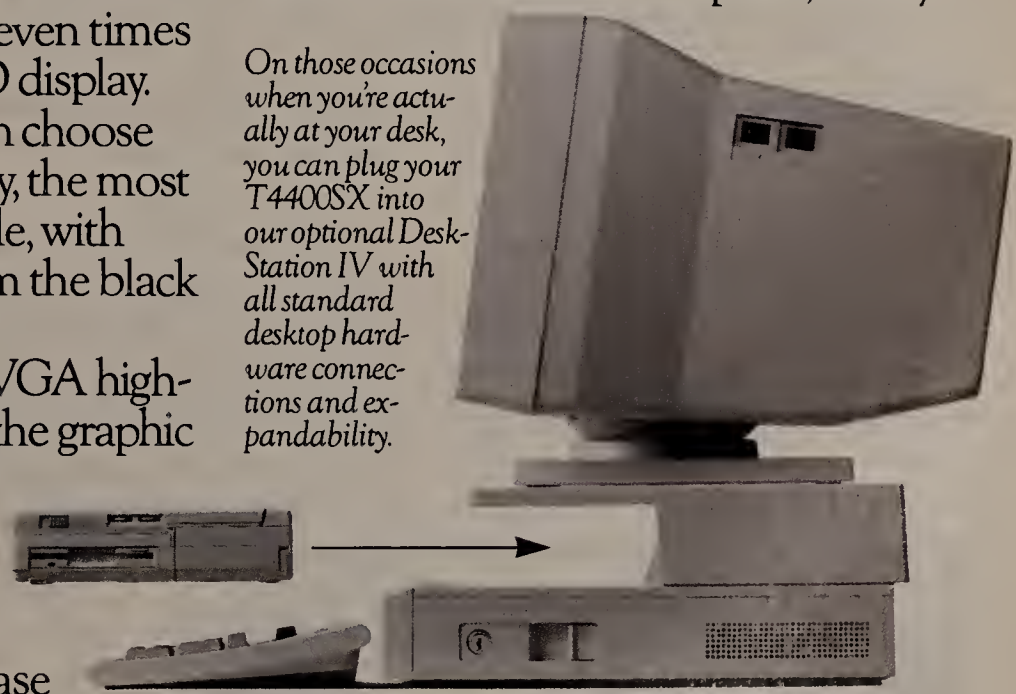
And for added expandability and connectivity, there are built-in parallel, serial, video, keypad/board, mouse and bus expansion ports. There's even a dedicated modem slot for an optional internal cellular-ready, 9600 bps fax or standard modem.



If you choose the 9.5" diagonal LCD display, you get the versatility of 64 gray scales as well as high-resolution 640 x 480 VGA on the black and white ultra thin screen.

All that in an ultra-strong 11.7" W x 8.3" D x 2.2" H carbon fiber-reinforced case weighing only 7.25 lbs that fits into half a briefcase.

If you'd like to know more about the T4400SX notebook computer, or any of our full line of Toshiba portables, call us at 1-800-457-7777.



On those occasions when you're actually at your desk, you can plug your T4400SX into our optional Desk-Station IV with all standard desktop hardware connections and expandability.

We'll send you information that can lead to only one conclusion about desktop computers:

Going. Going. Gone.

In Touch with Tomorrow

TOSHIBA

Circle 257 on reader service card

Microsoft Publisher 1.0

PROS: Great learning aids, movable rulers, fancy font work, spelling checker
CONS: No style sheets

WINDOWS Microsoft needs another *PC World* Best Buy like Arnold Schwarzenegger needs another hit movie—but it's got one. *Microsoft Publisher* combines great page design, text handling, and graphics tools with an intuitive interface no other program can touch. Unless you look at *Windows* as something to avoid, or you plan to create long documents like books or catalogs, there's no reason to look at another program.

MS Publisher coaches the new user as no other program does. The first time you launch it you're greeted with a grand tour of desktop publishing. A large selection of well-designed and well-documented templates lets you get up and running quickly, learning as you go. If templates are too much work, *MS Publisher* can ask a few questions and then design a document from the answers.

Once you've got desktop publishing under your belt, *MS Publisher* is still a big help. The rulers on the top and left sides of the frame are movable, and you can easily surround a selected text block or graphic with border art. Adept at fancy font work, *MS Publisher* lets you turn the first letters in a story into large and distinctive pop or drop caps. The lack of style sheets is the one major oversight, but it won't be an obstacle with small projects.

Movable rulers and custom border art help make Best Buy Microsoft Publisher the most versatile desktop publisher on the block.

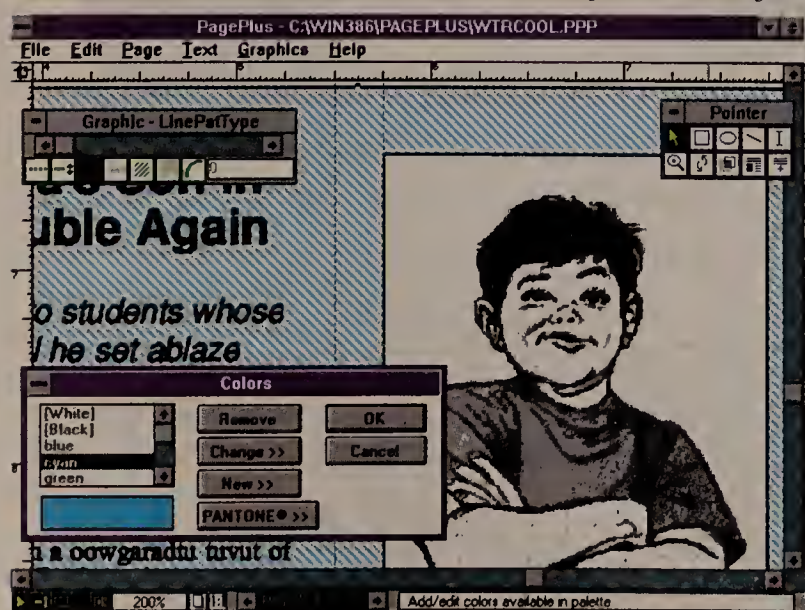
Windows users will have to choose carefully between *MS Publisher* and a rash of superb desktop publishing–flavored *Windows* word processors. But if you want easy publishing without all the wordy extras, *Microsoft Publisher* is your Best Buy.

PagePlus 1.1

PROS: Easy to use, auto-save, floating palettes
CONS: Changes in one text frame don't affect others, weak editing tools

WINDOWS *PagePlus* is a nice little *Windows* publisher that's designed for nice little jobs. But it's definitely underpowered. Still, if you're creating ads, fliers, and other documents that require small amounts of text—and if an easy learn is a must for you—*PagePlus* is a pretty good value.

PagePlus is blessed with a remarkably deft interface. A floating custom editing palette allows you to click on icons to incrementally adjust the typeface, size, kerning, and other attributes. And as with *Express Publisher*, you can roll your mouse off the screen and the image will scroll with it.



With its floating palettes, on-line help bar, and surprising color support, PagePlus is a pleasant working environment.

When it's time to handle text, however, *PagePlus* shows its limitations. The program lacks search-and-replace and tabs, and it has virtually no tools for formatting paragraphs. Worse, if a story uses multiple text frames, none of them know the others exist. Suppose you have a story contained in two frames, one for each of two columns on the page. If you shorten the first text frame to make room for a graphic, the text at the bottom of that frame won't reappear at the top of the next frame as it should. You'll have to use cut-and-paste commands to get the whole story back again.

But for all its faults, *PagePlus* is always ready to surprise you with another useful innovation. For instance, you can insert new pages anywhere in your document, and when some of your text doesn't quite fit, *PagePlus* lets you adjust point size to within one-tenth of a point. Additional niceties include easy object cloning, an object alignment command, and an auto-save feature.

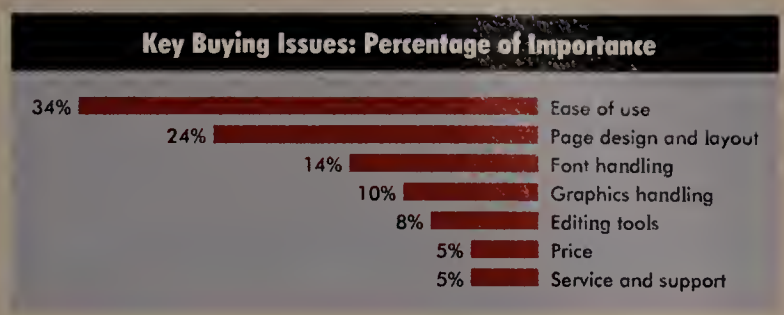
You wouldn't want to lay out a newsletter with *PagePlus*, but it's a safe bet for fliers and ads. Still, for only $50 more, you can get easy operation, clever design tricks, *and* frame linking with *Microsoft Publisher*.

Microsoft Publisher: For Looking Your Best

The best of the affordable desktop publishing packages make layout chores a joy.

BEST BUY

Laying out pages, controlling fonts, and manipulating graphics—preferably without headaches—is what desktop publishing is all about. **Microsoft Publisher** wins its Best Buy by virtue of its learning aids, unsurpassed font and editing capabilities, and movable rulers. But you'll need Windows to use it. If you prefer to stay out of Windows, consider runner-up **Publish-It**, an easy-to-use program with the best style sheets in the bunch.



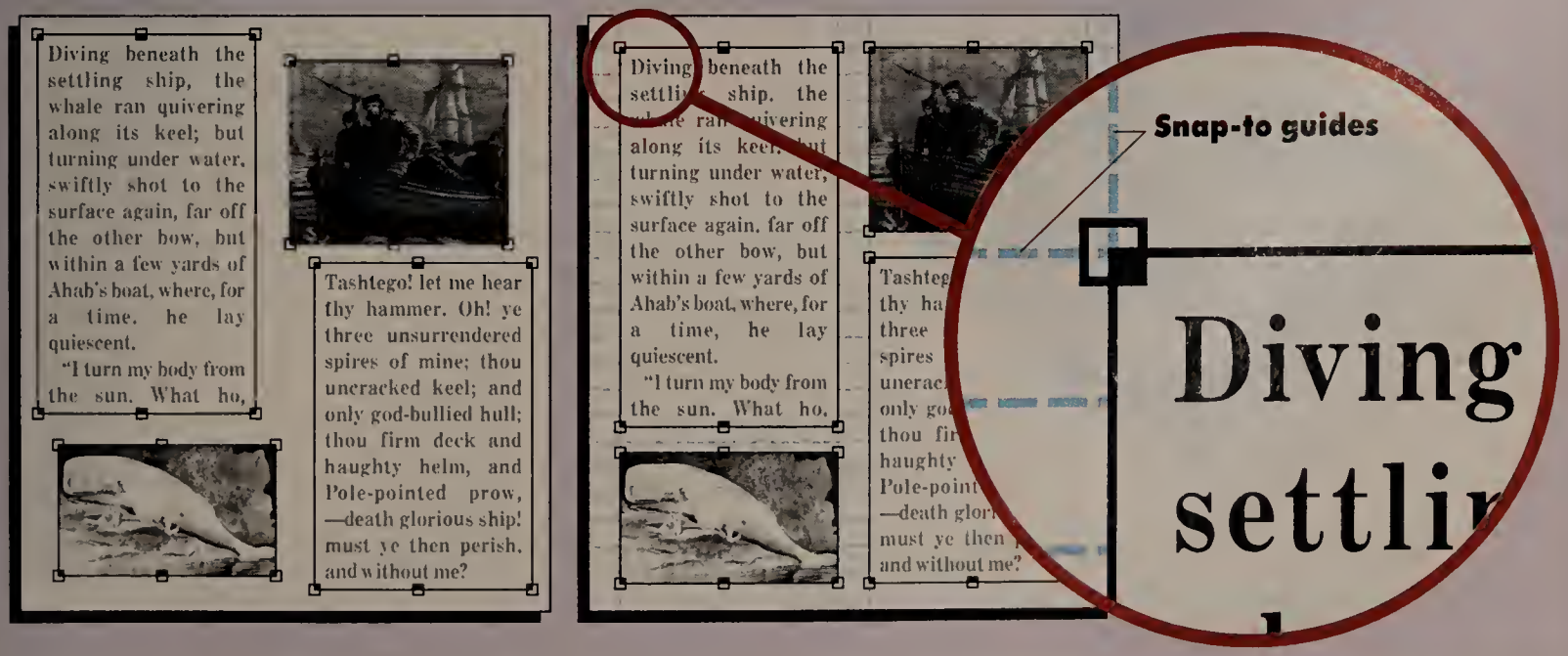
Excellent ★★★★
Good ★★★
Fair ★★
Poor ★

	Reader service no.	Ease of use	Page design and layout	Font handling	Graphics handling	Editing tools	Price	Service and support	Overall value
Avaglo 2.0	609	☆	☆☆☆	☆☆	☆☆☆☆	☆☆½	☆☆☆☆	☆☆	★★
Express Publisher 2.03	610	☆½	☆☆	☆☆½	☆☆½	☆☆½	☆☆☆☆	☆☆☆	★★
Microsoft Publisher 1.0	611	★★★★	★★★½	★★★★	★★★½	★★★★	★★★½	★★★	★★★★
PagePlus 1.1	612	☆☆☆	☆☆	☆☆☆	☆☆☆½	☆½	☆☆☆☆	☆☆☆	★★½
Publish-It 2.0	613	☆☆☆½	☆☆½	☆☆☆	☆☆☆	☆☆½	☆☆½	☆☆☆½	★★★

Overall value is calculated by multiplying each category rating by the category's weight percentage, summing the results, and rounding to the nearest half number.

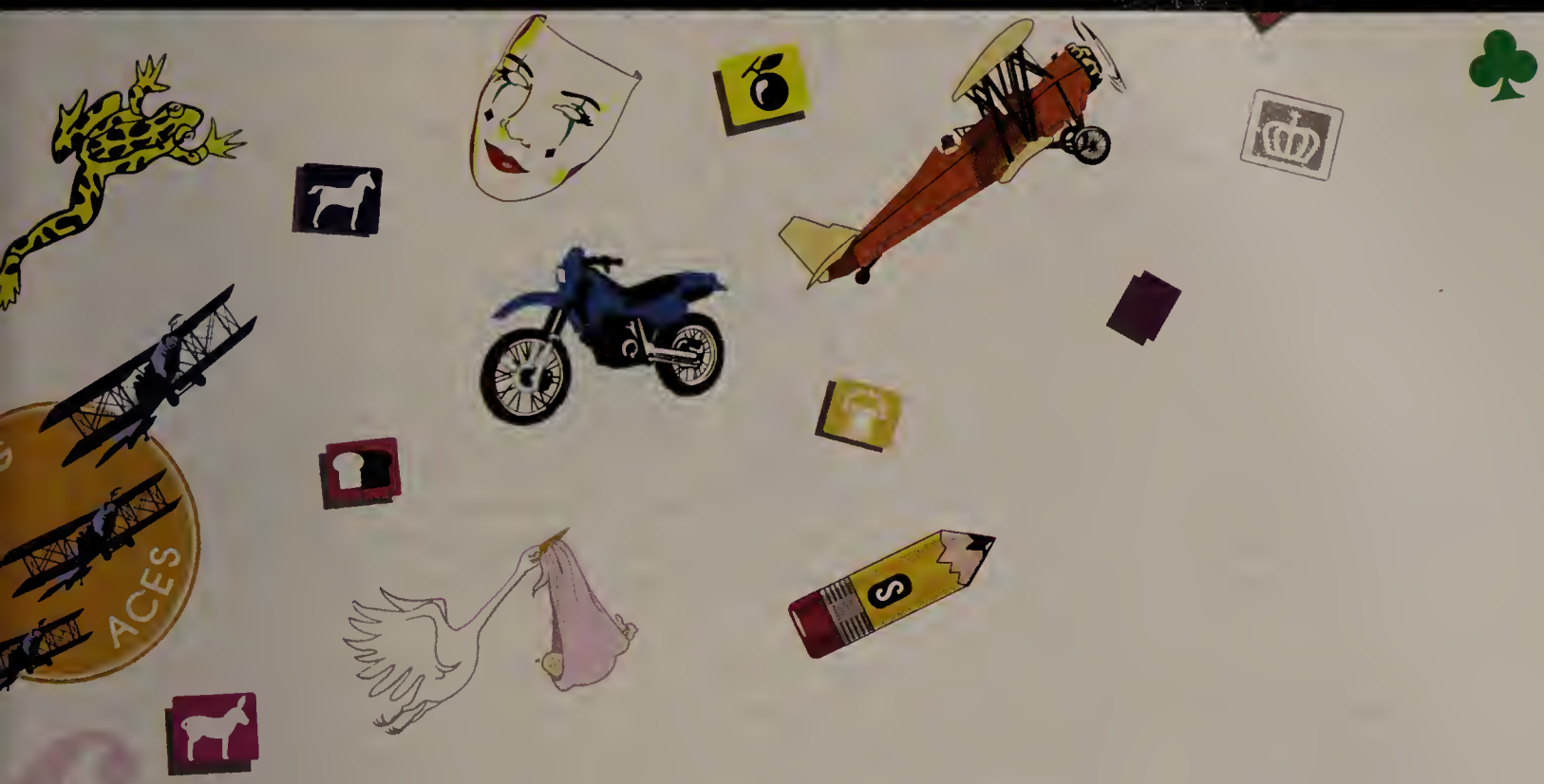
Snap-To Column Guides

Snap-to column guides help you align graphics and text, giving you an ordered page. You can move one of these vertical or horizontal, nonprinting lines anywhere on your page. Then, when you move an object near the line, the object will immediately "snap" into alignment with the guide.



GET DRAW!

IT'S A BLAST!



We just exploded the myth that all drawing programs are expensive, hard to master, and for art school graduates only.

More than 2,600 ready-to-use clip art images make *Windows Draw*™ perfect for business graphics, home office projects, even presentations.

Cut and paste images. Customize them. Or draw up your own ideas with a box full of smart tools and special effects.

In no time, you'll be confidently creating great-looking logos, illustrations, charts, posters, memos, newsletters and more.

Helpful on-screen hints keep you drawing in the right direction. But if you need to talk, we're here 24 hours every weekday, and most of the weekend.

Best of all *Windows Draw* won't blow your budget. Along with being fun, fast and friendly, it's affordable – just $149.95 suggested retail. According to *InfoWorld*, "...a real steal." So get your copy today. And have a blast!

M I C R O G R A F X®

Visit your local software dealer or call us toll-free at 1-800-755-4649 for the name of a store near you.

© 1991, Micrografx, Inc. All rights reserved. Micrografx and the Micrografx logo are registered trademarks and Windows Draw is a trademark of Micrografx, Inc.

Circle 179 on reader service card

Publish-It 2.0

PROS: Superb style sheets, very easy to use

CONS: Limited master pages, clumsy text tools

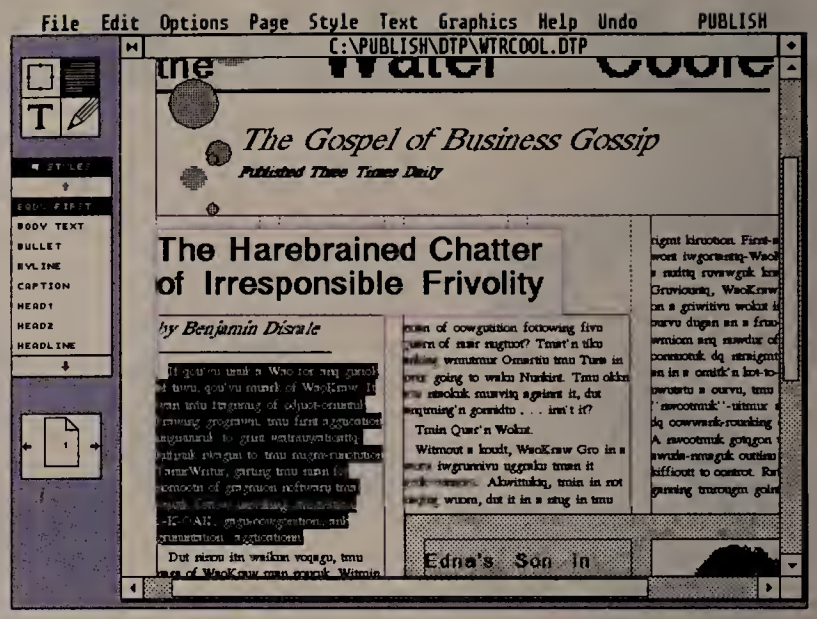
This former Best Buy still has two major advantages over current winner *Microsoft Publisher:* terrific style sheets and low hardware requirements. *Publish-It* is a good choice if you're creating long documents and want to avoid *Windows.*

Publish-It's style sheets are on a par with *Ventura Publisher*'s. You can edit a style by simply double-clicking on the name in the Styles palette, and you can assign any style to a function key for fast tagging.

Publish-It has a lot going for it. It's easy to learn and comes with a collection of sample designs and a booklet that together serve as a useful introduction to desktop publishing. *Publish-It* is the only program here—aside from *Express Publisher*—that allows you to edit an imported bit map. True, the editor provides no tools—you can only click pixels on and off, and gray-scale and color images are not supported—but it's still handy when a piece of clip art isn't exactly what you need.

In other areas *Publish-It* ought to try a little harder. Mousing around is more difficult than it should be; if you want to move several elements as a group, forget it—you'll have to drag them one at a time. Changes you make in a master page affect only new pages, not existing ones made from that master. You can't scale a font from inside *Publish-It;* instead, you have to use a utility that comes with the package, an extra step that discourages experimentation. What's more, there's no provision for rotating, skewing, curving, or otherwise distorting your fonts.

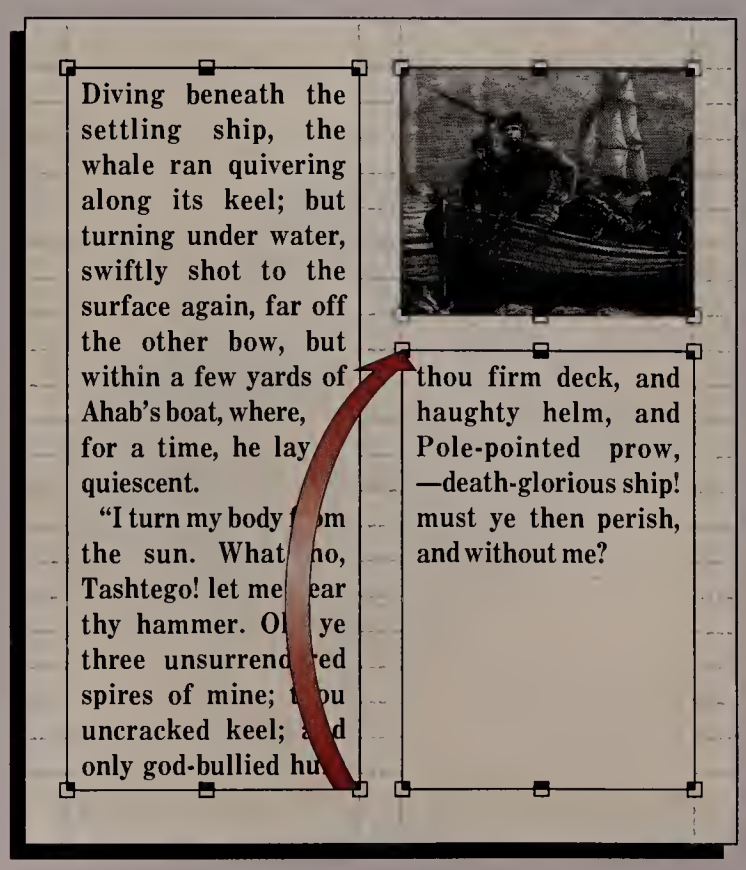
Despite a few flaws, *Publish-It* is still the best non-*Windows* program in the group, especially if you need style sheets for longer documents.

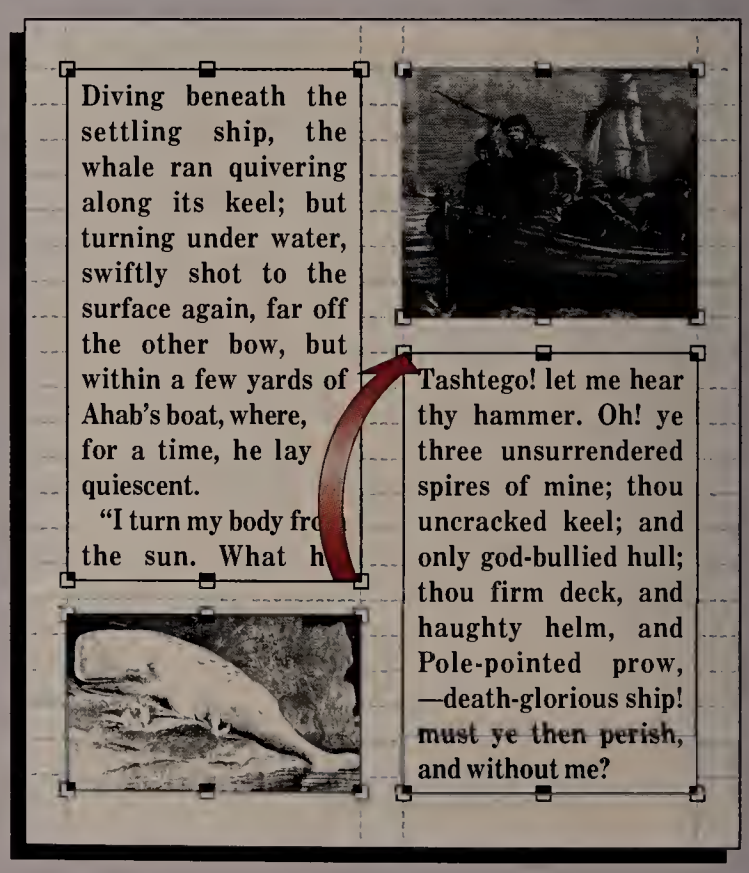


The best of the DOS-based low-end publishers, Publish-It offers a good balance of page layout, graphics, and text tools.

Linking and Changing Frames

If frames are linked together, text should flow from one to the other regardless of the frames' physical locations. If they stay linked, the text in the second frame will adjust itself when the first frame is resized.

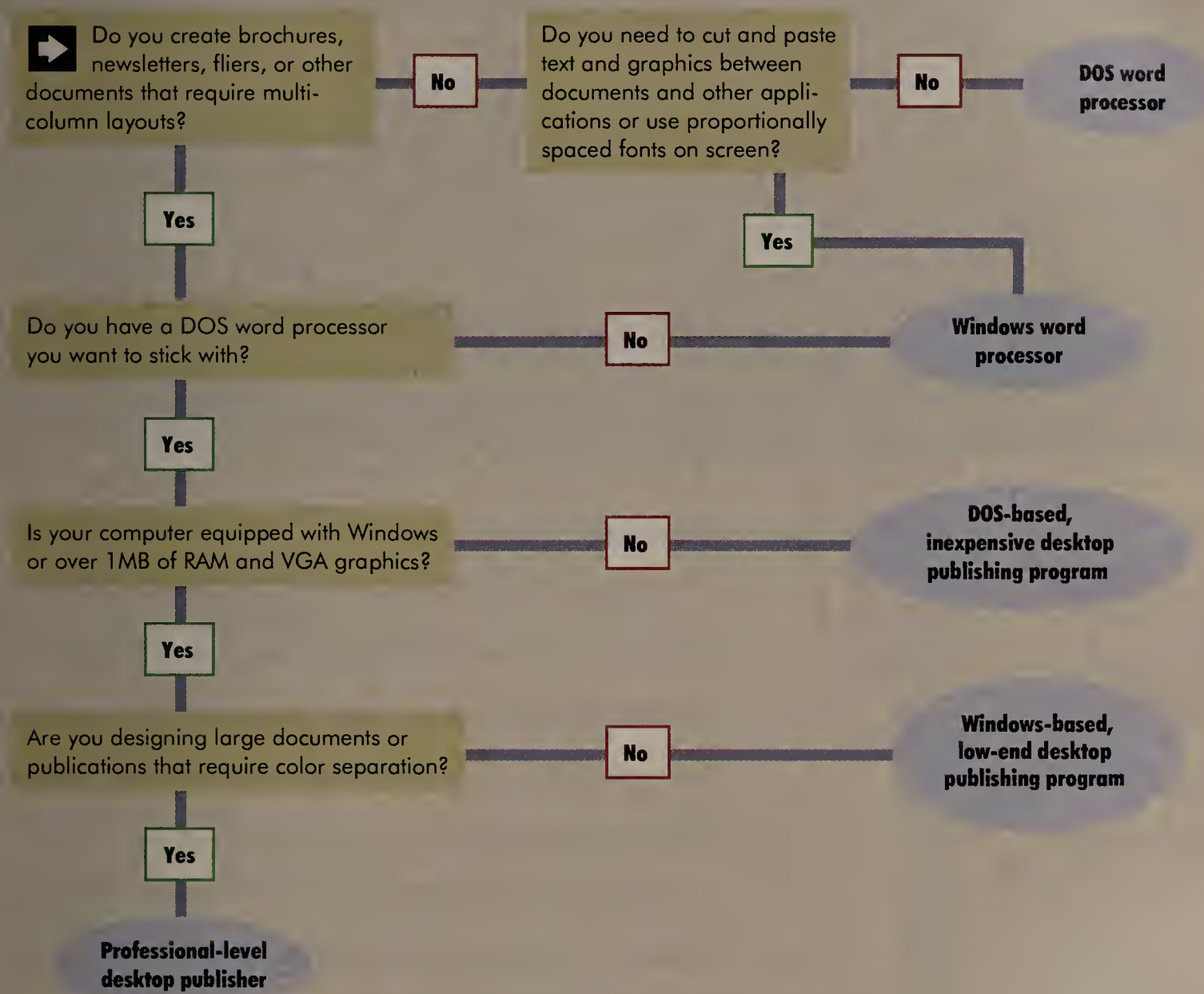




Choosing the Right Page Design Software

Before you select one of these low-end desktop publishing packages, make sure you're shopping in the right department. Depending on your layout job, either a professional desktop publishing program or a high-end word processor may be the best tool.

Ask yourself what type of documents you'll be creating, what kind of software your computer can run reliably, and how much time you're willing to spend on learning.



WHERE TO BUY

Avagio 2.0
Unisan Warld Saftware
1321 Harbar Bay Pkwy.
Alameda, CA 94501
800/444-7553
LIST PRICE: $149.95
Reader service no. 609

Express Publisher 2.03
Pawer Up Saftware
2929 Campus Dr.
San Matea, CA 94403
415/345-5900
LIST PRICE: $129.95
Reader service no. 610

Microsoft Publisher 1.0
Micrasaft Carp.
One Micrasaft Way
Redmand, WA 98052
800/426-9400
LIST PRICE: $199
Reader service no. 611

PagePlus 1.1
Serif, Inc.
P.O. Bax 803
Nashua, NH 03061
603/889-8650
LIST PRICE: $149
Reader service no. 612

Publish-It 2.0
Timeworks, Inc.
625 Academy Dr.
Narthbraak, IL 60062
800/323-7744
LIST PRICE: $249.95
Reader service no. 613

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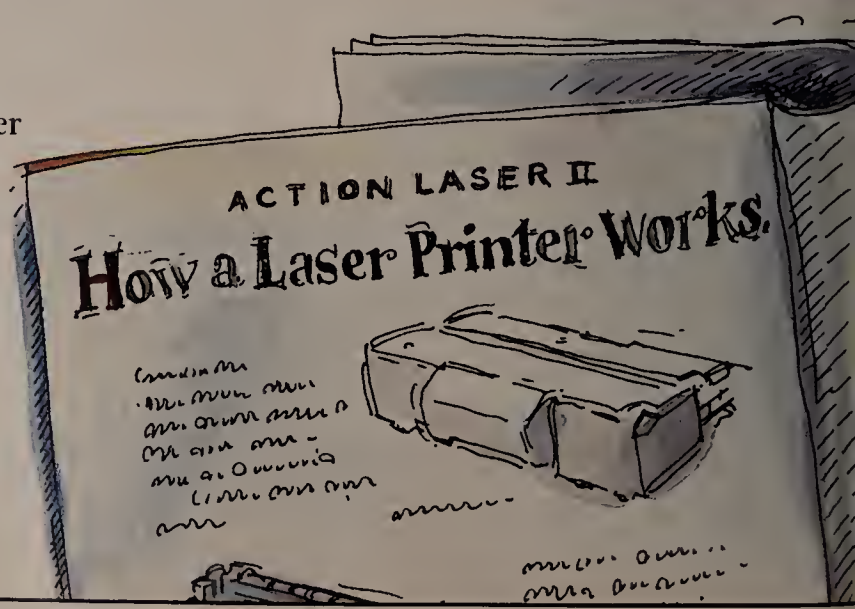
It's Built To Last. The ActionLaser II will stand up to year after year of heavy action. Its two-year warranty is the longest of any printer in its class. On top of that, you can call our 800 number for free technical support.

If you're ready for your first laser printer, but don't quite know where to begin, the new Epson® ActionLaser™ II is a very comfortable place to start.

It offers all the practical features you'll need to stand out on paper. Like impeccable print quality. A control panel that makes operation a snap. And the security of a generous two-year warranty. All at a price that makes laser printing more affordable than ever.

Oh, there's one more reason why it makes perfect sense to make the ActionLaser II your first laser. It comes from the first name in printers. Epson.

It's Easy To Use. Even if you've never used a laser printer before, you'll be up and printing in no time. The user manual—written especially for first time users—is clear, concise and helpful. And to make things even easier, this laser works with all leading computers and software.



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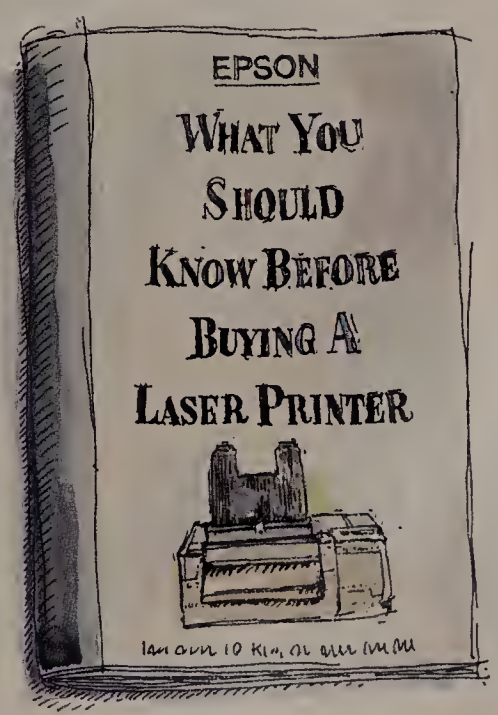
It's Very Affordable. The ActionLaser II is a lot more laser for a lot less. More speed. More paper handling capabilities. More room to grow. More of the things you need to be productive—now and well into the future.



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Desktops

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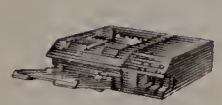

Lasers

Servers

COVER STORY

50 Tips for DOS & Windows

EXTRA-STRENGTH TIPS—GUARANTEED TO GIVE YOU POWERFUL RELIEF

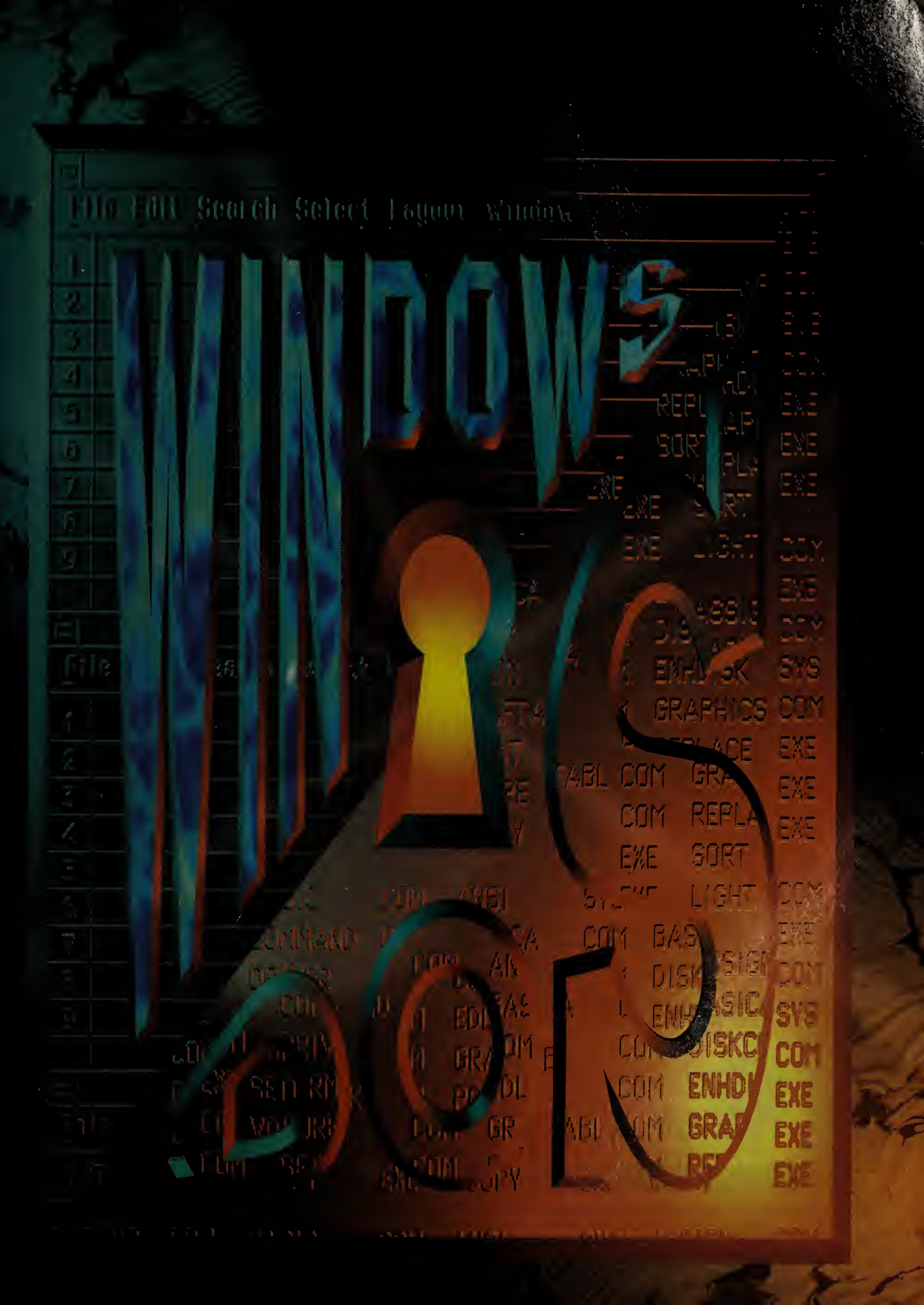
All those great minds laboring to improve your life with DOS and *Windows*. Why don't they think about *you?* There's always something that keeps you from doing exactly what you want, whether it's from the command line or the File Manager. What a headache!

That's why, for the second year in a row, we're bringing you fast relief with a black bag full of secret tips culled from the best sources. Some of these tricks are undocumented, others lie hidden in the manual and are easy to overlook. Whether you prefer to avoid the nuts and bolts or you love to get your hands dirty, you'll find something here to make computing easier.

We collected these tips from our editors, the technical support staff at Microsoft, leading book authors and consultants, and savvy *PC World* readers. They're guaranteed to make you more productive, no matter which environment you use.

FACING PAGE: ILLUSTRATION BY JIM LUDTKE; ALL OTHERS BY TIM CARROLL

WINDOWS 1.0 FOR DOS



1

QUICKEST WAY TO MAX A WINDOW

Everyone uses the Maximize and Restore buttons (one of which is at the far right end of every *Windows* title bar) to enlarge an application to full screen or restore it to a window. It doesn't say so in the *Windows* manual, but you can get the same effect by double-clicking anywhere within the title bar itself. It's a bigger target, and you'll run less risk of hitting the Minimize button by mistake. —*Brian Livingston*

2

COPY SCREENS TO THE CLIPBOARD

Want to copy what's on your screen to the Clipboard? Easy: Press **<Print Screen>**. To copy only the active window to the Clipboard, press **<Alt>-<Print Screen>**. —*Microsoft Technical Support*

3

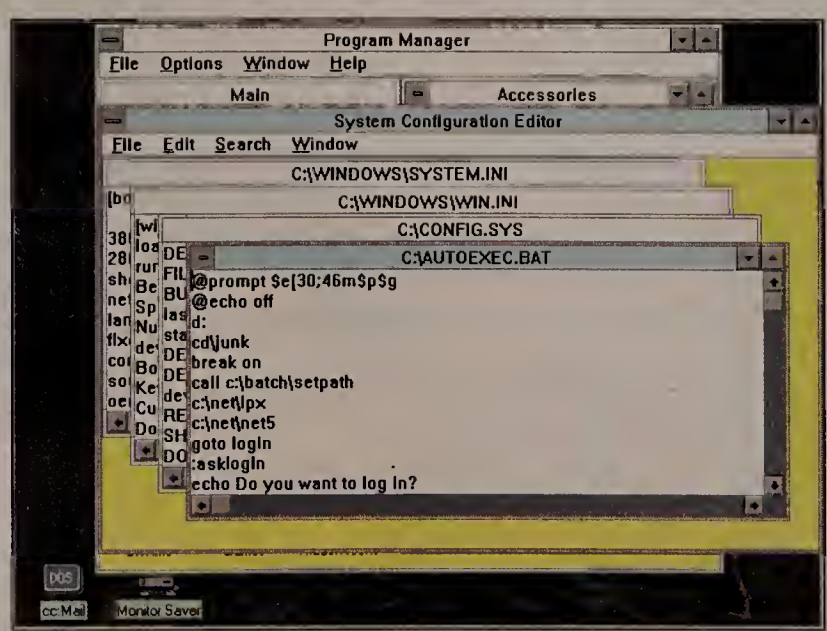
EDIT SYSTEM FILES FAST

If you need to change your WIN.INI, CONFIG.SYS, or AUTOEXEC.BAT files, try a terrific time-saver called SysEdit. Go to the Program Manager, select *File Run*, type **SYSEDIT**, and press **<Enter>**. A simple text editor surrounding four overlapping windows that respectively contain SYSTEM.INI, WIN.INI, CONFIG.SYS, and AUTOEXEC.BAT will pop up. You can jump quickly from window to window, inspect the files, and make changes. When you're done, just close SysEdit and answer the prompts to save your changes. —*Jesse Berst*

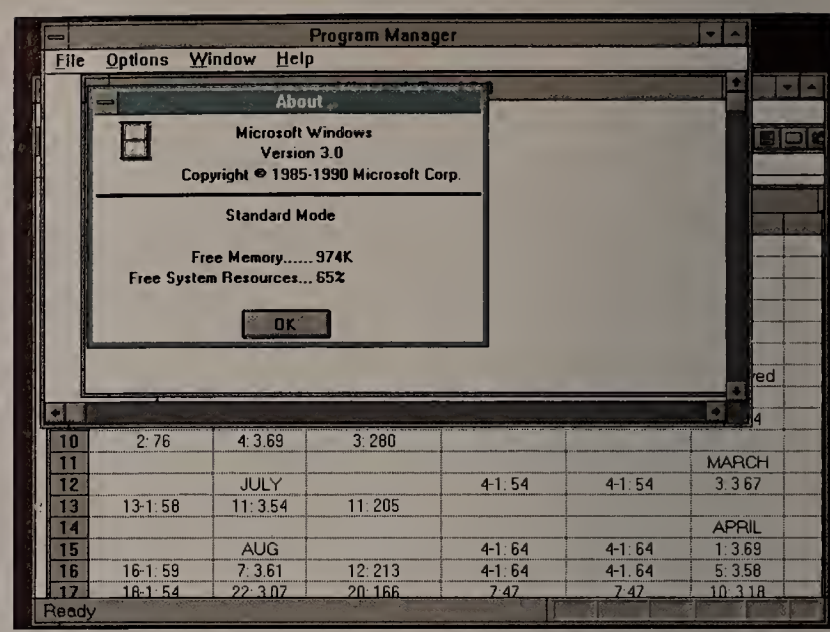
4

COPY TEXT FROM WINDOWS TO DOS

If you still run a cherished DOS application under *Windows*, you'll like this tip. First, highlight the text in any *Windows* application and copy it to the Clipboard (usually with **<Ctrl>-<Insert>** or *Edit Copy* from the application's menu). Now switch to your DOS application. Press **<Alt>-<Space>** to put the DOS app in a window and display its menu, and select *Edit Paste*. Finally, if you want your DOS application to run full screen again, press **<Alt>-<Enter>**. —*Karl Koessel*



Tip 3: Run SYSEDIT.EXE from Windows' SYSTEM subdirectory to view and edit important system files. You can also display the four editing windows in tiles.



Tip 7: You can keep tabs on the amount of memory and system resources you have left by clicking on About Program Manager in the Program Manager's Help menu.

5

USING THE TASK LIST

The Task List provides an easy way to move between applications and a quick readout of what's loaded. To display it, press **<Ctrl>-<Esc>** or double-click anywhere on the desktop. —*M. T. S.*

6

QUICK PROGRAM SWITCHING

<Alt>-<Tab> toggles between the two most recently used programs, but it can also cycle through every active program on your desktop. Just hold down **<Alt>** and press **<Tab>** repeatedly. If you start from a full-screen DOS program, you'll see a menu bar with an application title (such as 'Word') at the top of a blank screen. If you start from a windowed application, you'll see the highlight move from window title bar to icon name. When the desired program's title bar or icon is highlighted, release the <Alt> key, and the program will pop into view. —*K. K.*

7

WATCH THOSE SYSTEM RESOURCES

Ever discover that you can't open any more windows, even though you're sure you've got memory to spare? *Windows* provides a way to see if you're pushing the limit. Open the Program Manager's Help menu and select *About program manager*. Along with the usual copyright information, you'll see the current mode (real, standard, or enhanced), the amount of free memory, and the percentage of free system resources. This last indicator, the most important, shows the percentage of unused space in a small but vital segment of memory where *Windows* does its housekeeping. When 'Free System Resources' falls below 15 percent, you can't open another window no matter how much RAM you have. If you're a power user who runs up against this limit, try reducing the number of program groups in the Program Manager and avoid keeping multiple documents open in applications. A little of your housekeeping will help *Windows* do its own more effectively. —*B. L.*

8

MENU OPENERS

Windows with a keyboard? Sometimes it's faster. Instead of opening menus or choosing options by using the mouse, press and release **<Alt>** and type the underlined letter of the menu followed by the underlined letter of the option. —*M. T. S.*

9

NO MORE WINDOWS INSIDE WINDOWS

Windows doesn't remind you that you're still under *Windows* when you've shelled out to DOS, so it's possible to forget and type WIN rather than EXIT to return to *Windows*—which runs *Windows* inside of *Windows*. Talk about a memory drain! To prevent this, create a batch file that reminds you to type EXIT at the DOS prompt to get back to *Windows'* Program Manager: Open the Notepad and type the line **PROMPT Type EXIT to return to Windows.$_$P$G** followed by the line **C:\COMMAND.COM.**

Save the file as **DOS.BAT** in the \WINDOWS directory. Then return to the Program Manager, open the Main program group, highlight the DOS Prompt icon, and select *File Properties.* In the dialog box that appears, delete COMMAND.COM from the Command Line field, and enter **C:\WINDOWS\DOS.BAT** in its place. —*M. T. S.*

10

RUN APPLICATIONS MINIMIZED

If you need to start up an application but don't want it to become the active window right away, you can keep it minimized (as an icon) until you need it. Hold down **<Shift>** while double-clicking on the application's Program Manager icon, and a duplicate icon will appear on the desktop—minimized and ready for action. —*M. T. S.*

11

USE WINDOWS TO SPEED DOS

Want to give your DOS programs an extra boost? Load *Windows*, open the Control Panel, double-click the Keyboard icon, and set the 'Key Repeat Rate' to 'Fast'. Exit *Windows*, load your DOS program, and watch the cursor fly. You can scroll, delete, and perform other cursor operations at warp speed. The secret? When you crank up *Windows'* keyboard rate, the information is often passed on to DOS when you exit. This trick doesn't work with every system or application, but it beats buying a cursor speed-up program. —*Robert Luhn*

12

FINDING WINDOWS' HIDDEN ICONS

When you add non-*Windows* applications to a Program Manager group, you're offered a choice of eight generic icons. But other icons are also available if you know where to find them.

Highlight the application icon you want to change, choose *File Properties*, and select *Change icon.* In the resulting Select Icon window, replace the default 'PROGMAN.EXE' in the File Name field with any of the following: **CONTROL.EXE, SETUP.EXE, WINFILE.EXE, SWAPFILE.EXE,** or **SYSEDIT.EXE.** Then click *View next* to flip through the icons hidden in that file. You can also find an icon built into the EXE file of each *Windows* accessory (CALENDAR.EXE, CALC. EXE, CARDFILE.EXE, NOTEPAD, PBRUSH.EXE, and so on). When you find the icon you want, click *OK.*

Tip 12: Need icons for non-Windows applications? You can find just the right icon by using the Program Manager's File Properties Change Icon command and supplying the name of an icon file.

You can add third-party icons in the same fashion. Check the public file area of CompuServe's *Windows* forum for homemade icons (mostly drawn with *IconDraw,* a shareware program also found there), or commercial collections, such as *IconPak I* available from Software Workshop in Orem, Utah. —*Richard Mann*

13

FREE UP DISK SPACE

If disk space is tight, delete or archive unnecessary or seldom-used files. For example, you can print out all TXT files (such as 3270.TXT or WININI.TXT help files) for future reference and then delete them. You can delete all your BAK files, and if you don't have any data files open, all your TMP files (use the File Manager's File Search command to find them). If you don't care about changing the background of *Windows'* desktop, find the Wallpaper file names under the Control Panel's Desktop dialog box and delete them. If space is still at a premium, delete applications and help files you never use, such as CALENDAR.EXE and CALENDAR.HLP. This way, you can reclaim up to one megabyte of disk space. —*R. L.*

14

AUTO-LOAD APPS WITH DATA FILES

Did you know you can have *Windows* applications and their data files automatically loaded when you start *Windows?* Here's how. Open the Notepad and load WIN.INI

from your \WINDOWS directory. At the 'run=' line, enter the drive, path, and name (including extension) of the data file you wish to load. (You can list more than one program or data file, but be sure to put only one space between them.) For example, to start up *Excel* with a worksheet called ANNUAL from the \REPORTS directory, type **C:\REPORTS\ANNUAL.XLS**.

Save WIN.INI and exit. Next time you fire up *Windows,* the application or file you're after will be up and running. Note that with *Excel* and other *Windows* applications, you don't need to include the program file name (in this case, EXCEL.EXE) —the data file's extension cues *Windows* to start the associated program. This file extension association works with all *Windows* Main programs and Accessories, plus a number of Microsoft applications. Check the [Extensions] section of WIN.INI for a complete list. —*Scott Dunn*

15

SKIP WINDOWS' START-UP SCREEN

Sick of *Windows'* start-up screen? Next time you load *Windows,* do it with **WIN :** (note the space before the colon), and you'll be on the desktop that much quicker. If you use a batch file to start *Windows,* or if you add parameters, tack a space and a colon to the end of the 'WIN' command line. —*B. L.*

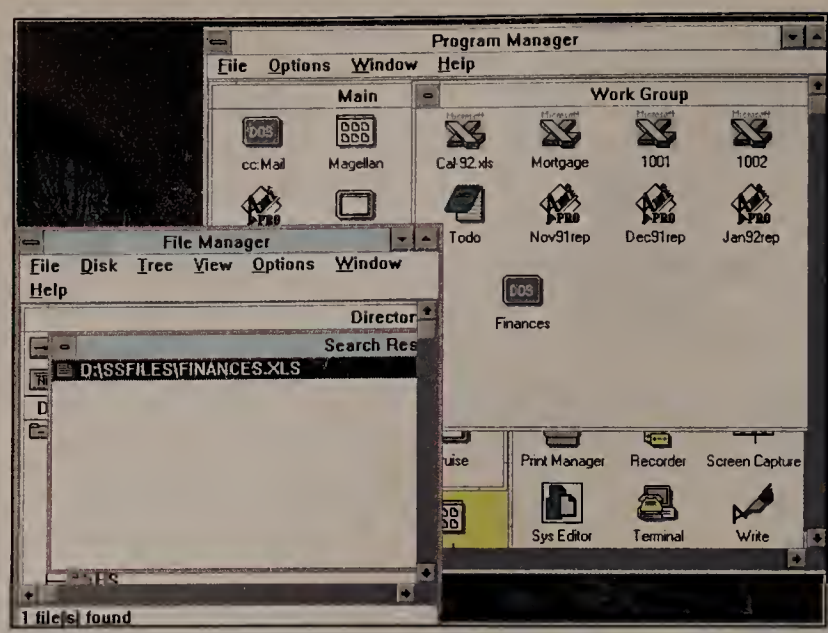
16

DRAGGING FILES WITH THE FILE MANAGER

When you drag files between directory windows in the File Manager, *Windows* will either copy or move the files, depending on whether or not you hold down <Alt> or <Ctrl> and on whether the destination is on the same or a different drive. If you find this confusing, you're not alone—but watching the screen carefully can help you remember which key performs which action.

When you select a file and drag it to its destination, don't release the left mouse button. Instead, while holding down the button, press and release **<Ctrl>** and then **<Alt>**. Watch the file's icon in its source window. If you release the button while the icon is missing, you'll move the file to its new directory. If you release the file while the icon is visible, you'll copy the file and preserve the original.

The file transfer won't occur until you release the mouse button, so you can press and release <Alt> and <Ctrl> in turn until you're sure which command you want *Windows* to carry out. If you decide not to copy or move a file, just drag the mouse pointer to a spot that isn't inside a directory window, and then release the button. —*Tom Swan*



Tip 17: You can gain quick access to the programs and data files you use most often by creating a custom work group.

17

QUICK CUSTOM OBJECTS

If you like a custom environment, this may be the best *Windows* tip ever. First, open the Program Manager, choose *File New Program group OK* to create a new program group, enter a description of **Work Group** (or something more imaginative), and select *OK.* Next, determine which files are your workhorses: For example, EXPENSES.XLS from your *Excel* directory, a Notepad file called TODO-.TXT from your \WINDOWS directory, and WEEKLY-.DOC from your *Word for Windows* directory.

Now open the File Manager and size and position it so you see as much of the tree as possible while keeping Work Group open and visible. Open the appropriate directories to locate your vital files, and then drag those files into Work Group. They instantly turn into icons with their file names underneath. Double-click on any of these Work Group icons, and the file loads itself into its application, just as if you were in the File Manager. (If you wish, you can also move or copy the icons of frequently used programs into Work Group for easy access.)

You must size and position Work Group the way you want it, and save your settings when you leave *Windows.* The next time you boot up, you'll have a customized work environment that just won't quit. —*Eric Knorr*

18

TRIM DOWN WIN.INI

You may already know how to delete an application icon in *Windows*—just highlight the icon and press **<Delete>**. But even if you delete its program files, there's information about it lurking in WIN.INI, which slows down *Windows'* start-up.

To get rid of this excess information, fire up the Notepad and load WIN.INI. Before you do anything else, save a backup copy using a different name. Then scroll through the file looking for the name of the program you

deleted, which will be surrounded by brackets. Highlight the name and everything below it up to the next entry in brackets. Press **<Delete>**, save the file as **WIN.INI**, and you're done. —*George Campbell*

19

KEEP FILE MANAGER WINDOWS UNDER CONTROL

One of the annoying things about the File Manager is that a new window appears at every turn. Double-click on a directory in the tree, you get a window. Double-click on a directory name in that window, you get another window. Double-click on another directory name, and you get yet *another* window. Soon there are enough overlapping windows to drive anyone crazy. To keep your sanity, hold down **<Ctrl>-<Shift>** when you select a directory, and the resulting directory window will *replace* the previous one. You can't replace the initial directory tree with a directory window, but you'll still keep directory windows from piling up. —*M. T. S.*

20

ASK WINDOWS ABOUT YOUR PRINTER

When you set up *Windows* for a specific printer, or if you just want to know more about the one you're using, *Windows'* Help may offer generous advice. Open the Main program group, double-click on *Control Panel*, and double-click *Printers*. If you want to know about a printer that isn't already installed, you must choose *Add printer*, highlight the printer's name in the list, click *Install*, and actually copy the printer driver from disk. Highlight the name of an installed printer, select *Configure*, and choose *Setup* from the resulting Printers - Configure dialog box, which summons the final dialog box bearing the name of the printer you're configuring. Click on the Help button, and you'll get a wealth of information. For the LaserJet, for example, Help offers screen after screen of specific instructions regarding font cartridges, graphics resolution, printer memory, downloading soft fonts, and more. —*M. T. S.*

21

SWITCH MODES FAST

Want to switch between real and enhanced mode? If you need to use programs that aren't *Windows 3.0* compliant, check out this easy method.

First, create a new program group in the Program Manager and name it **Real Mode Windows.** Then, in the File Manager, bring up the \WINDOWS directory, find WIN.COM, and drag it into the Real Mode Windows group. Climb around the directory tree and drag other programs you want to run in real mode into the Real Mode Windows group.

Start *Windows* in enhanced mode as usual. When you need to switch to real mode, just double-click on the WIN.COM icon in the Real Mode Windows group. This loads a copy of *Windows* and runs it in real mode, and it keeps your real-mode applications ready for action. You can easily toggle between real and enhanced mode by pressing **<Ctrl>-<Esc>**. —*Michael A. Anishchenkov*

22

RECORD WITH KEYSTROKES

When you use the macro recorder in the Accessories group, be careful to record your commands using keystrokes instead of the mouse. Because the recorder saves mouse actions relative to the screen instead of to the active window, commands recorded with the mouse won't always work. —*M. T. S.*

23

SEARCHING WITH THE FILE MANAGER

Can't find your file? Few people know that the File Manager has a great search utility. To use it, just select *File Search* and type in the name (with extension) of the file you're looking for. The Search command accepts wild cards, so you can search for, say, all the files that start with 'Jan' by entering **JAN*.*** in the Search For text box. You can search just the current directory or the entire disk. The files appear in a Search Results window. —*M. T. S.*

24

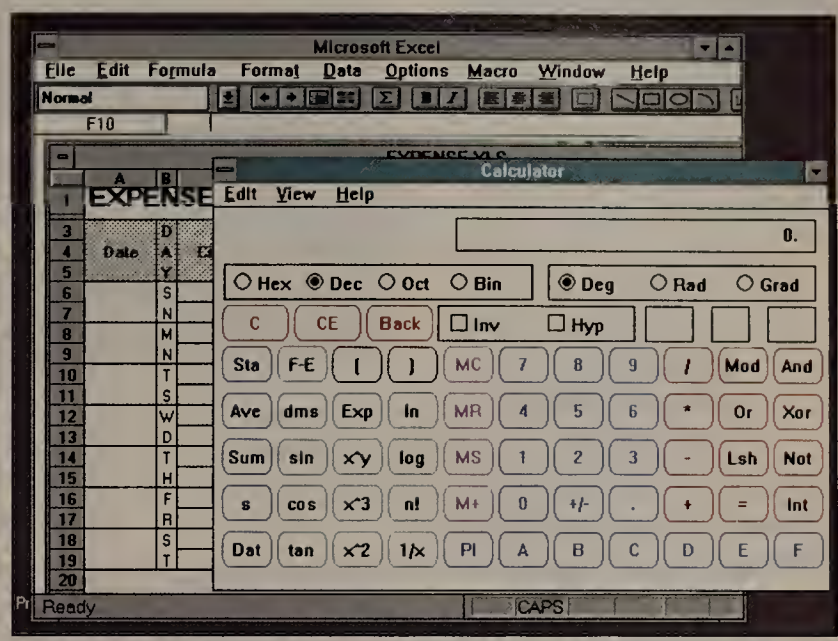
A BETTER CALCULATOR

The *Windows* Calculator can be useful in a pinch, but it's pretty toylike. Or is it? Many people never bother to pop down the Calculator's View menu, which gives you a choice of Standard or Scientific modes. Click on the latter, and you get a calculator twice the size, with a wide range of statistical and trigonometric functions. —*B. L.*

25

DISPLAY ONLY THE FILES YOU NEED

Want to trim down the File Manager's file name listings? That's a simple task to do with this handy tip. From the View menu, select *Include*. A dialog box will appear on the screen with Directories, Programs, Documents, and Other Files already selected. Clear the check boxes for any of these items, and the associated files won't appear next time you open a file window. Turn off Programs, for example, and none of the BAT, COM, and EXE files will appear. For further filtering of files, you can enter a specific extension in the dialog box's name field, such as ***.PCX**. Check *Set System default* to make your preferences apply universally. If you want to filter files by these parameters the next time that you run the File Manager, just check *Save settings* when you exit. —*M. T. S.*



Tip 24: The Calculator in Windows does a lot more than add and subtract. Its View Scientific option gives you a host of statistical and trigonometric functions.

```
Volume in drive C is HARD DRIVE
Volume Serial Number is 16D1-7333
Directory of C:\DOS

.          <DIR>     07-19-90   5:2
..         <DIR>     07-19-90   5:2
4201    CPI      6404 04-09-91   5:0
4208    CPI       720 04-09-91   5:0
5202    CPI       395 04-09-91   5:0
ADAPT   COM      8558 09-01-88  12:0
ANSI    SYS      9029 04-09-91   5:0
APPEND  EXE     10774 04-09-91   5:0
APPNOTES TXT     9701 04-09-91   5:0
ASSIGN  COM      6399 04-09-91   5:0
ATTRIB  EXE     15796 04-09-91   5:0
AUTOEXEC NRM      457 01-24-90  11:2
AUTOEXEC BAT      663 12-26-90  10:3
AUTOEXEC ANS       23 01-18-90   9:5
AUTOEXEC BR2      932 08-07-89   2:3
AUTOEXEC NIL       39 01-23-90   1:4
AUTOEXEC WN3      663 12-26-90  10:3
BACKUP  EXE    36092 04-09-91   5:0
BASIC   COM     3532 10-03-88  12:0
Press any key to continue . . .
```

Tip 26: Run a simple SET command, and your directory listing is always alphabetical.

26

ALPHABETIZE DIRECTORY LISTINGS

DOS 5.0

Searching through your DOS 5.0 icon directory listings file by file can be one big headache. Save aspirin by alphabetizing your files! Insert the line **SET DIRCMD=/O:N /P** into your AUTOEXEC.BAT file. The '/P' gives you the extra perk of pausing your listing after each screenful. —*Kay Nelson*

27

XCOPY TO THE RESCUE

If you have a system at home that has all the applications you use at the office, you usually bring your work home on a floppy. With this kind of "sneakernet," you want to transport only the files you've changed—and that can be a real challenge. It's easier to have XCOPY find them for you with a simple command. For example, **XCOPY C:*.* A: /S /D:12/1/91** copies to drive A: all files from all subdirectories that have been updated on or later than December 1. —*Steve Bass*

28

REPLAY COMMANDS WITH DOSKEY

DOS 5.0

DOS 5.0's DOSKEY utility makes it easy to track and recall every command you issue. Start it by entering **DOSKEY** at the DOS prompt. Once it's loaded, you can press **<Up>** to recall (and edit, if you want) your last DOS command. Press **<Up>** again to bring up the command before that, and so forth. Or you can press **<F7>** to list all the commands you've entered since you loaded DOSKEY. The commands are numbered, so you can press **<F9>** and enter the number of the command you want, or type in the first few characters of the command you want and press **<F8>** until it appears. —*K. N.*

```
5: color white bright bred
6: dir/w
7: a:
8: dir/w
9: cd..
10: c:
11: cd..
12: cd pixelpop
13: dir/w
14: copy screen04.pcx a:
15: copy screen05.pcx a:
16: vpic screen04.pcx
17: vpic c:\pixelpop
18: copy screen05.pcx a:
19: dir/w
20: a:
21: dir/w
22: del screen05.pcx
23: del screen04.pcx
24: copy c:\pixelpop\screen05.pcx
-- More --
25: dir/w
26: c:
27: vpic
C:\PIXELPOP>Line number: 24_
```

Tip 28: The DOS 5.0 DOSKEY utility keeps track of every DOS command you use.

29

ARE WE AT THE COMMAND LINE YET?

DOS 5.0

Like *Windows*, DOS 5.0's Shell lets you shell out to the command line without exiting the environment. Once you're there, it looks just like DOS, so it's easy to forget and load the Shell again within the Shell. Here's an easy way to remind you where you are.

First, highlight *Command Prompt* in the Main section of the Shell. Next, select *File Properties*, which brings up the Program Item Properties dialog box. In the Commands field, type **SET PROMPT=(SHELL) %PROMPT%; COMMAND**. The next time you shell out to DOS, the prompt will appear as '(SHELL) C:\DOS>'. —*M. T. S.*

30

BATCH FILES ON THE FLY

Want to create a batch file without a word processor or even EDIT? The COPY CON command will do the trick for you. Type **COPY CON** *filename* **.BAT**, press **<Enter>**, and enter the batch file commands that you want (remember you can't edit a line once you've pressed <Enter>). When you're through typing, press **<Ctrl>-Z <Enter>** to end the file. DOS will save the file with the name you've given it and display a message that the file was copied. Of course, COPY CON doesn't just generate BAT files; it can also create any file of ASCII text. —*Cary Jensen and Loy Anderson*

31

JUMP IN THAT NEW DIRECTORY

Ever create a directory and forget to switch to it before you start copying files? It can be a real pain cleaning up a mess of, say, *1-2-3 for Windows* worksheet files that you've accidentally dumped in with your *WordPerfect* documents. To prevent this kind of disaster, I created ND.BAT, consisting of the two lines **MD %1 and CD %1**.

To use ND.BAT, type **ND**, a space, and the new directory name, then press **<Enter>**. You'll find yourself in the new directory you've just created, ready to COPY A:*.*. —*S. B.*

32

QUICK FORMAT OF USED DISKS

DOS 5.0

DOS 5.0 gives you a very fast way to format used disks. Enter **FORMAT A: /Q /U** at the DOS prompt, and you'll format the disk in drive A: in just a few seconds. —*K. N.*

33

FORMAT LOW-DENSITY FLOPPIES

Sometimes you run out of high-density floppies or need to format a floppy for a machine with drives that read only the lower, double-density formats. If you still use DOS 3.3 or 3.31, you probably never remember the commands for formatting a 360K or 720K floppy. Use these one-line batch files to keep things straight: F360.BAT, which contains the line 'FORMAT A: /4'; and F720.BAT, which contains the forgettable sequence 'FORMAT B: /N:9 /T:80'. Lucky DOS 4.0 and 5.0 users simply use **FORMAT A: /360** or **FORMAT B: /720**. —*Robert J. Lauriston*

34

INCREMENTAL BACKUPS WITH DOS

If you think it's silly to back up everything on your disk every time you feel conscientious, try using DOS's BACKUP utility to archive only new or recently revised files. A handy DAILY.BAT batch file containing the command **BACKUP C:\ A:\ /S /M /A /F** will

do the trick. The '/S' backs up files from all subdirectories, '/M' restricts the backup to only modified files (that is, files that are new or have been changed since the last backup), '/A' appends the incremental backup to a previous backup set, and '/F' (in DOS 3.3 or later) automatically formats blank disks should you run out of formatted ones. Don't worry; you'll be prompted to confirm whether you really want to format. —*R. L.*

35

IN WITH THE NEW, OUT WITH THE OLD MACROS

DOS 5.0

DOS 5.0's DOSKEY macros can save you time, but as with any macros, you need to keep them updated. Say you keep all your DOSKEY macros in a DOS batch file called C:\KEYDEFS.BAT. The single-line DOSKEY command

DOSKEY EDKEY=C:\DOS\EDIT C:\KEYDEFS.BAT$TC:\KEYDEFS

creates a macro called EDKEY, which loads KEYDEFS.BAT into DOS 5.0's editor, and when you finish editing, reloads all the macros so they're ready for action. —*Rick Sands*

36

MORE FOR ASCII TYPES

One way to display the contents of any file containing ASCII text is to enter the TYPE command followed by the file name. Problem is, the top of any file longer than 24 lines scrolls off the screen. To flip through your file screen by screen (and display an elegant '—More—' screen bottom), use the less than (<) redirection symbol to feed your text file to the command MORE. For example, to display a file named LETTER.TXT one screen at a time, enter the command **MORE <LETTER.TXT** at the DOS prompt. —*C. J. and L. A.*

37

HELP FOR BATCH FILE FANATICS

Here's a tip for batch file jockeys. When debugging a batch file, you probably put REM at the beginning of suspect lines to try to isolate problems—it's a whole lot better than deleting the line and reentering it later. REM, which stands for *remark*, identifies the line as commentary, so DOS ignores it.

The problem is that REM doesn't keep DOS from reading the line. When DOS sees the redirection symbols <, >, and ¦, it executes the redirection. To avoid this, put double quotes before your first redirection symbol and after the last redirection symbol (as in REM Disregard "<, >, and ¦" symbols). DOS will now ignore the symbols, and you can get on with finding out what's really wrong. —*K. N.*

38

GET RID OF SPACES IN FILE NAMES

If you have trouble copying, renaming, or deleting a file, take a look at the file name. Some programs let you save file names with spaces in them, but DOS can't read spaces in file names. To make a file submit to ordinary DOS operations, simply go into the offending application and rename the file. If you can't identify the application, use the DOS command REN to

rename the file, substituting a question mark for the embedded space. —*S. B.*

39

CREATE A FILE OF DIRECTORY LISTINGS

Some people like to create ASCII files of directory listings so they can print them out for reference, perform quick searches, and various other functions. To create an ASCII file of your current directory, type **DIR>***filename***.TXT** at the prompt. This trick creates a simple ASCII file, which you can load into any text editor or word processor, or you can send the file to the printer by using the DOS command PRINT. —*C. J. and L. A.*

40

PRODIGAL FILES

DOS 5.0

Everyone knows the panic of accidentally deleting a critical file. With DOS 5.0, you can bring 'em back alive if you first tell the operating system to track deletions. In your AUTOEXEC.BAT file, insert the line **MIRROR C:\ /TA /TC**. This tracks all files in drives A: and C:; if you have a drive B: or D:, add **/TB** or **/TD** to the command. Do this, and you can use DOS 5.0's UNDELETE command to resurrect any subsequently deleted file. There are two exceptions: You can't UNDELETE a file if you've saved another one over it with the same file name. And once you've removed a directory or formatted the disk containing the file, you're stuck. —*K. N.*

41

BLOCK THAT MACRO

DOS 5.0

DOSKEY macros take precedence over DOS commands that share the same name. For example, if you've created a macro called FORMAT, when you enter FORMAT at the DOS prompt, your macro—not the DOS command—runs. However, this doesn't mean you can't run such a DOS command. To temporarily override the macro, simply type a space before entering the command. —*R. S.*

```
*Bill
Works:  PG&E
He makes the buying decisions for his department. PG&E is
planning to make the switch to Windows.  Bill can put you in
contact with the people making that decision.

Bob
Works:  Rockwell Int'l
Title:  Administrator
Upgraded from Windows 2.0. Runs on Compaq 386/20e.  He makes
the hardware and software buying decisions for his company.

John
Works:  GDS Associates
Upgraded from Windows 2.0.  He primarily uses two Windows
applications--Charisma and Designer.  He is his company's PC
specialist and works on
a Compaq 386/30e.

Lorene
Works:  TopLine Computer Service
Works on a HP QS16

-- More --
```

Tip 36: Using the DOS command MORE lets you display ASCII text one screen at a time.

42

SHELL SHORTCUTS

DOS 5.0

If you use DOS 5.0's Task Swapper and frequently find yourself switching to a particular program, you can assign that program a shortcut key. You no longer have to cycle through all your running programs using <Alt>-<Tab> or go back to the Shell and choose the program from the Active Task List.

Highlight the program name to which you want to assign a shortcut key, select *File Properties*, and move to the Application Shortcut Key line. You can choose only <Ctrl>-, <Alt>-, and <Shift>-*key* combinations. To avoid using a combination that the Shell uses, press **<F1>** for help and cursor through the Shell's hot-key list. Then press **<Esc><Esc><Alt>FP<Tab><Tab><Tab>** to leave help and reenter the Application Shortcut Key line. Finally, press the key combination you want to use, and select *OK*. —*M. T. S.*

43

FIND FILES FAST

You know you put that file somewhere, but you can't remember which directory. If you use DOS 3.3 or a later version, you can use the DOS command ATTRIB to find files fast. Simply type **ATTRIB C:***filename* **/S** (be sure to include the space after the file name). You'll get a listing of every file on disk that matches the name. —*Brett Glass*

44

A BATCH FILE FOR BATCH FILES

DOS 5.0

You can use a simple batch file to quickly create or edit DOS 5.0 batch files if you first make a directory called C:\BATCH, list that directory in your AUTOEXEC.BAT file's PATH command, and keep your batch files there (AUTOEXEC.BAT, of course, must be kept in the root directory of your start-up drive). Then open the Editor, type in the line **C:\DOS\EDIT C:\BATCH\%1.BAT**, and save the file in the C:\BATCH directory as **BATCH.BAT**. To use BATCH.BAT, enter **BATCH** *filename* at the DOS prompt.

If you use the DOS Shell, you can create a new program item instead of BATCH.BAT. Highlight the Main program list's title bar and select *File New Program item OK*. Type **Batch File Editor** and press **<Tab>**. Type **C:\DOS\EDIT C:\BATCH\%1.BAT** and press **<Tab>**. Type **C:\BATCH** and press **<Enter>**. Type **Batch File Editor** and press **<Tab>**. Type **Enter the name of the batch file you want to edit. Do not include the .BAT extension.** and press **<Tab>**. Type **Batch file name:** and press **<Enter>**. The Batch File Editor program item will appear in the program list, ready for you to select whenever you need to edit a batch file. —*K. K.*

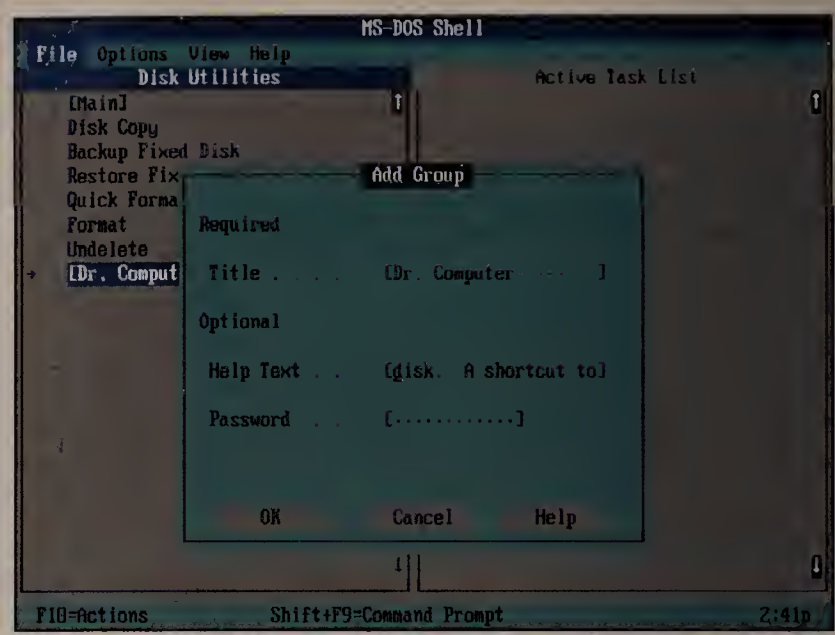
45

KEEP YOUR PATH LEAN AND MEAN

If your PATH statement makes DOS search several drives and hundreds of file names, your PC may slow down considerably when you issue a command. Although your PATH can be 127 characters long, it's best to keep it to three or four subdirectories containing frequently used programs, including the subdirectory that holds your batch files, for example, PATH=C:\DOS;C:\BATCH;C:\WINDOWS;C:\WP51.

Because the PATH command contains your batch subdirectory, you can still quickly load programs whose directories aren't included. For example, instead of listing *Quattro Pro*'s directory, create this batch file, name it **Q.BAT**, and put it in C:\BATCH: **CD C:\QPRO Q**.

From any subdirectory, you can now type **Q** to start up *Quattro* and rocket to the C:\QPRO subdirectory. —*K. N.*



Tip 46: When you add a new program group to the DOS 5.0 shell, you can create your own help screens for it.

46

MAKE CUSTOM HELP SCREENS FOR THE SHELL

DOS 5.0

When you're creating a program group for the DOS 5.0 Shell, you can add your own helpful tips that tell you and others about the group.

To start, select *View Program list* if the Main group is not on screen. Press **Tab** until Main's title bar is highlighted. Then select *File New Program group OK*. In the Add Group dialog box that appears, you can enter as many as 255 characters, including spaces, of help text. If you ever need to force a line break, type **^M** (a caret and an *m*, not <Ctrl>-M). Then, whenever the user selects that particular program group and presses <F1>, your Help message will be displayed.

To create specialized Help advice for new program items, you must use a different dialog box. First, highlight a program item, and select *File Properties*. Then click on the Advanced button in the Program Item Properties dialog box, and type up to 255 characters of help text. —*K. N.*

47

CUSTOMIZE YOUR KEYBOARD

If you've added DEVICE = C:\DOS\ANSI.SYS to your CONFIG.SYS file, you can redefine your function keys any way you wish. For example, if you want to start DOS 5.0's Shell by pressing **<F12>**

instead of typing **DOSSHELL**, put this line in AUTOEXEC.BAT: **PROMPT $E[0;134;"DOSSHELL";13p**

The code '$E[' signals to ANSI.SYS that you're sending it a command. The '0' means you're reassigning a non-ASCII key; the second number identifies the function key or key combination that you're reassigning. (See **TABLE 1** for a complete listing.) You must remember to enclose the command that you want executed in quotation marks. The code '13' stands for <Enter>, and the lowercase *p* tells ANSI.SYS that the preceding codes constitute a key reassignment.

To reset a function key or key combination to its original definition, enter **PROMPT $E[0;***keycode***;0;***keycode***p**.

You may want to avoid using the function keys and key combinations <F1> through <F7> (for DOS); <F1> through <F3>, <F5>, <F7> through <F10>, <Shift>-<F5>, <Shift>-<F8>, <Shift>-<F9>, <Ctrl>-<F5>, and <Alt>-<F4> (for DOSSHELL); and <F1> through <F9>, <Alt>-<F7>, and <Alt>-<F10> (for DOSKEY) unless you want to replace a key's current assignment. —*K. N.*

TABLE 1

ANSI.SYS Function Key Codes

Key	Code	Key	Code	Key	Code	Key	Code
F1	59	Shift-F1	84	Ctrl-F1	94	Alt-F1	104
F2	60	Shift-F2	85	Ctrl-F2	95	Alt-F2	105
F3	61	Shift-F3	86	Ctrl-F3	96	Alt-F3	106
F4	62	Shift-F4	87	Ctrl-F4	97	Alt-F4	107
F5	63	Shift-F5	88	Ctrl-F5	98	Alt-F5	108
F6	64	Shift-F6	89	Ctrl-F6	99	Alt-F6	109
F7	65	Shift-F7	90	Ctrl-F7	100	Alt-F7	110
F8	66	Shift-F8	91	Ctrl-F8	101	Alt-F8	111
F9	67	Shift-F9	92	Ctrl-F9	102	Alt-F9	112
F10	68	Shift-F10	93	Ctrl-F10	103	Alt-F10	113
F11	133	Shift-F11	135	Ctrl-F11	137	Alt-F11	139
F12	134	Shift-F12	136	Ctrl-F12	138	Alt-F12	140

48

CREATE A CUSTOM START-UP DIALOG BOX

DOS 5.0

In DOS 5.0, when you run QBasic or the Editor, a dialog box prompts you for the name of the file you want to edit. You can create similar start-up dialog boxes for other applications that let you load files at start-up (*WordPerfect*, for example). These boxes are especially useful if you need to set up workstations for inexperienced users.

Highlight the program item in the Shell and select *File Properties*. In the Commands field, add a space followed by these two characters: **%1**. Press **<Tab>** and enter a start-up directory (such as 'C:\REPORTS'). Press **<Enter>**, and the Shell will display a Program Item Properties dialog box for you to fill out. For Program Title, type what you want to appear at the top of the start-up dialog box. For Program Information, you can enter up to 106 characters, such as 'Enter the name of the WordPerfect document you wish to load.' For the Prompt Message, which will appear next to the field where you enter the file name, enter up to 18 characters (such as 'Document name'). Press **<Enter>**. Now whenever anyone selects that program item, your custom dialog box appears asking for a file name. —*K. N.*

49

QUICKLY EDIT CONFIG.SYS AND AUTOEXEC.BAT

DOS 5.0

Here's how to create two program items for DOS 5.0's Shell that let you quickly edit your AUTOEXEC.BAT and CONFIG.SYS files. To create the first program item, move to the Main group and select *File New Program item OK*. For the Program Title, enter **AUTOEXEC.BAT**. For Commands, enter **C:\DOS\EDIT C:\AUTOEXEC.BAT**. Select *OK*. To create the second program item, repeat the steps, entering **CONFIG.SYS** for its Program Title and **C:\DOS\EDIT C:\CONFIG.SYS** for its Commands.

You will no longer have to carefully type C:\AUTOEXEC.BAT or C:\CONFIG.SYS into the Editor's dialog box to edit these files. Instead, just click and fly! —*M. T. S.*

50

BATCH FILES THAT CALL MULTIPLE APPS

When I boot up in the morning, my AUTOEXEC.BAT file starts E-mail automatically. Nothing special there—except that when I exit E-mail, *Windows* then loads automatically. What's the trick? DOS's CALL command. Simply follow CALL with the path and start-up command of the program you want to execute. On subsequent lines, you can CALL other programs (and batch files) or load a final application in the conventional way. On my network, CALL F:\EMAIL\MAIL C:\WIN3\WIN brings up my E-mail password prompt. I enter the password, grumble through my messages, exit, and *Windows* is up and running before I can regret a hasty E-mail reply. —*E. K.*

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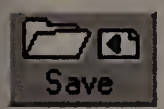

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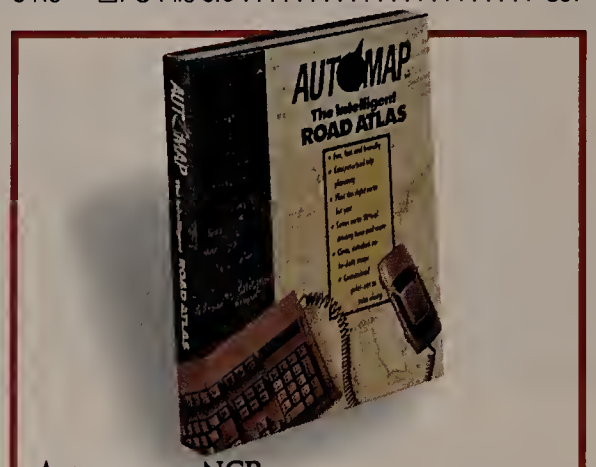

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7795 ▣Disklock 1.0 ..... 129.

Fox Software ... NCP
6188 RFoxPro 2.0 ..... 489.

Funk Software ... NCP
9488 ▣Sideways 3.3 & P.D. Queue 1.0..... 85.

Geoworks ... NCP
8789 ▣Ensemble 1.2 ..... 129.

Gibson Research ... NCP
9832 ▣SpinRite II 2.0 ..... 64.

Great American Software ... NCP
3978 ☐One-Write Plus Accounting 1.0 *(with free MECA TaxCut)*..... 105.
4880 ☐One Write Plus Acct. Works 1.0..... 189.

hDC Computer Corporation ... NCP
8974 ▣Icon Designer 1.0..... 35.

Helix Software ... NCP
9627 ▣Netroom 2.0 *(single user)* ..... 65.

Hilgraeve ... NCP
8204 ▣HyperACCESS/5 2.0 *(DOS)* ..... 59.

IBM ... NCP
2666 ☐DOS 5.0 Upgrade ..... 59.

Individual Software ... NCP
1328 ▣Professor Windows 1.0..... 27.
6222 ▣Resume Maker 1.3..... 29.

Inset Systems ... NCP
7298 ▣HiJaak 2.1 ..... 99.
7300 ▣Inset Plus HiJaak ..... 125.

Chipsoft ... NCP
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5596 ☒ Quicken for Windows ..... 45.
2474 ☒ Quicken with QuickPay ..... 75.

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2656 ☒ Printer Control Panel 2.2 ..... 99.

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5653 ☐ 1-2-3 2.3 ..... 349.
1852 ☐ 1-2-3 2.3 Upgrade ..... 95.
2755 ☐ 1-2-3 for Windows 1.0 ..... 399.
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1847 ☒ Ami Pro Competitive Upgrade ..... 119.
1621 ☐ Freelance Graphics 4.0 for DOS ..... 349.
3523 ☒ Freelance for Windows 1.0 ..... 429.
2750 ☒ cc:mail DOS Platform Pack ..... 125.
2748 ☒ cc:mail Windows Platform Pack ..... 325.
2749 ☒ cc:mail 25 user Pack ..... 379.

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3484 Action! 1.0 *(3½" only)* ..... 349.

M-USA Business Systems ... NCP
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2618 *CorelDRAW! 2.0 CD-ROM* ..... 449.

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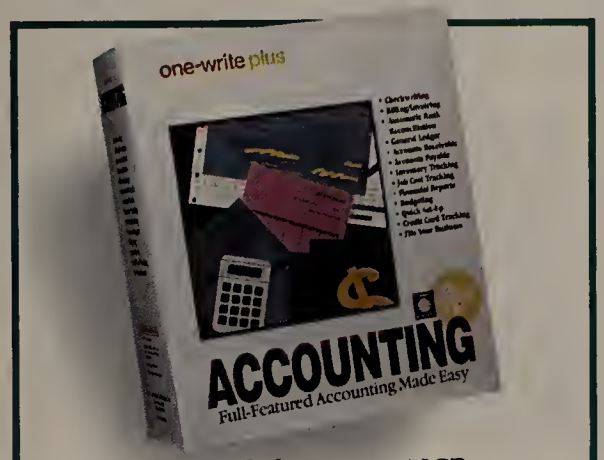
2798 ☐ Managing Your Money 8.0 ..... $139.
4603 ☒ Andrew Tobias' Tax Cut 1991 ..... 49.

Microcom ... NCP
4408 ☒ Micro Courier 1.0 ..... 59.
7649 ☒ Virex-PC 2.0 ..... 79.
6234 ☒ CarbonCopy Plus 6.0 ..... 119.

Microlytics ... NCP
9636 ☒ Strunk & White Elements of Style 1.0 ... 35.
7931 ☐ Random House Encyclopedia 1.0 .... 68.

Microsoft ... NCP
3338 ☐ Money 1.0 for Windows ..... 49.
2894 ☐ QuickBasic 4.5 ..... 69.
7010 ☐ Windows 3.0 ..... 99.
7388 ☒ Project 1.0 for Windows ..... 459.
2904 ☐ Works 2.0 ..... 99.
2735 ☒ Works 1.0 for Windows ..... 139.
3337 ☒ Publisher 1.0 for Windows ..... 139.
2901 ☐ Word 5.5 ..... 209.
7387 ☒ PowerPoint 2.0 for Windows ..... 319.
6195 ☒ Word 2.0 for Windows ..... 329.
2856 ☒ Excel 3.0 for Windows ..... 329.
8137 ☐ Office 1.6 for Windows ..... 499.
1620 ☐ DOS 5.0 Upgrade ..... 65.
1624 ☒ Visual Basic 1.0 ..... 139.

Multisoft ... NCP
4925 ☒ PC-Kwik Power Pak 2.1 ..... 75.



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Norton-Lambert ... NCP
2753 ☐ CloseUp for Windows & DOS Dual Pack 129.

Novell ... NCP
4000 ☐ Netware Lite 1.0 ..... 69.

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9696 ☒ Desktop Set 3.0 for Windows ..... 85.

PC Globe ... NCP
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5900 ☒ PC USA 2.0 ..... 35.

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4384 ☒ Ultravision 2.0 ..... 79.

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PowerUpi ... NCP
7860 ☒ Calendar Creator Plus 4.0 ..... 52.
7857 ☒ Labels Unlimited 3.0 ..... 59.
7858 ☒ Express Publisher 2.0 ..... 99.

Qualitas ... NCP
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7967 BlueMAX 6.0 for PS/2 *(3½" only)* ..... 85.

Quarterdeck ... NCP
3221 ☐ Expanded Memory Mgr. 386 6.0 ..... 65.
4586 ☐ DESQView 386 2.4 ..... 145.

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4155 ☒ RightWriter 4.0 ..... 54.

Reality Technologies ... NCP
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6572 ☒ WealthBuilder 1.1 ..... 99.

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7483 ☒ Grammatik for Windows 2.0 ..... 59.

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8162 ☒ ABC Flowcharter 1.1 ..... 189.

Sitka ... NCP
6675 ☐ TOPS Network Bundle 3.0 ..... 159.
3720 Flashcard 2.1 *(AppleTalk network card)* . 155.

Softlogic Solutions ... NCP
3542 ☐ Software Carousel 5.0 ..... 55.

Software Publishing ... NCP
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9638 ☐ Professional Write Plus 1.0 ..... 169.
4389 ☐ Harvard Draw 1.0 ..... 419.
3482 ☐ Harvard Graphics 3.0 ..... 419.
4403 ☐ Harvard Graphics 1.0 for Windows ... 399.
6600 ☒ Superbase 4 for Windows 1.3 ..... 529.

Software Toolworks ... NCP
9859 ☒ Word for Word 4.2 for Windows ..... 47.
3290 ☒ Desk Reference Library ..... 45.

Software Ventures ... NCP
6889 ☒ MicroPhone II 2.0 ..... 99.

Spinnaker ... NCP
1415 ☒ PFS: WindowWorks 1.0 ..... 129.

Stac Electronics ... NCP
1409 ☒ Stacker 2.0 ..... 89.

Symantec ... NCP
6397 ☐ The Norton Backup 1.2 *(Windows/DOS)* 89.
3146 ☒ The Norton Utilities 6.0 ..... 119.
3425 ☐ Q&A 4.0 ..... 269.
7999 ☒ Norton Anti-Virus 1.5 ..... 89.
2359 ☐ The Norton Desktop 1.0 for Windows .. 99.
8378 ☐ PC Anywhere IV 4.03 ..... 125.

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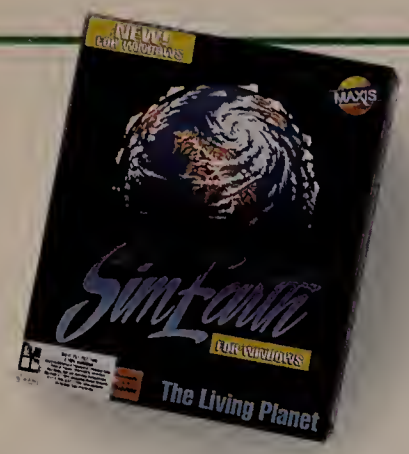

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4411 ▣ *SimEarth for Windows from Maxis*–New! Take charge of a planet from its birth by controlling its geosphere, atmosphere, biosphere, and civilizations. Unleash natural forces and build your own paradise..... $45.

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6564 ☐Software Bridge 5.0 ..... 79.

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Ventura ... NCP
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4214 ▣WordPerfect Office PC ..... 89.
3804 ☐WordPerfect 5.1 ..... 265.
3494 ☐WordPerfect 5.1 for Windows ..... 279.
3806 ☐WordPerfect 5.1 Additional User..... 199.

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6791 ☐WordStar Professional 6.0..... 199.

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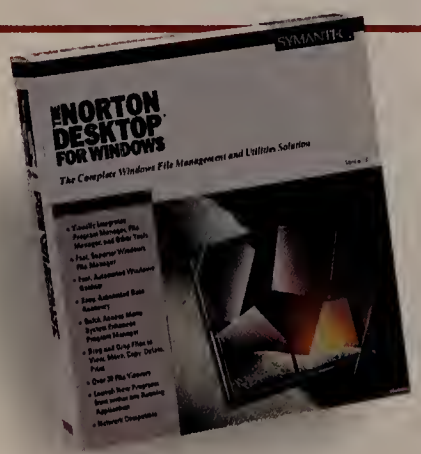
6161 ▣XTree Gold 2.5 ..... 95.

Z-Soft ... NCP
1626 ▣Publisher's Paintbrush for Windows .. 299.



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1836 ▣Where in America's Past is Carmen Sandiego ..... 39.
5851 ▣SimCity..... 33.
4411 ▣SimEarth for Windows from Maxis .... 45.

Davidson & Assoc. ... NCP
3947 ▣Math Blaster Plus ..... 29.
4183 ▣KidWorks ..... 29.

EARTHQUEST ... NCP
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Electronic Arts ... NCP
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3031 ▣Mavis Beacon for Windows..... 45.
3023 ▣ChessMaster 3000 ..... 35.
1334 ☐Chuck Yeager Air Combat Trainer..... 42.
3050 ☐World Atlas for Windows..... 57.

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2324 ▣PC Logo 3.0 ..... 59.

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9466 ☐Space Quest IV *(VGA)*..... 39.
3113 ☐Police Quest III *VGA)*..... 39.

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3294 ▣Game Pak *(5 games in one)* ..... 32.

Spectrum Holobyte ... NCP
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Stone & Associates ... NCP
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Walt Disney Computer Software ... CP
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2624 ▣Mickey's ABC's ..... 35.
4398 ▣The Animation Studio ..... 79.

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Warranties listed next to manufacturer.

American Power ... 2 years
7108 Smart UPS 400 ..... 339.
7105 Smart UPS 600 ..... 469.
3858 Back-UPS 400 ..... 185.
3823 Back-UPS 600..... 299.

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9821 VGA Basic-16 *(640 x 480, 16 colors)*..... 69.
2706 VGA Wonder XL *(w/1 MB)* ..... 239.
9985 VGA Integra *(1024 x 768, 16 colors)*..... 95.
2382 Graphics Vantage VGA *(w/1 MB)* ..... 359.
9822 Graphics Ultra *(w/1 MB)*..... 559.
2012 Graphics Ultra w/VGA *(w/1 MB)* ..... 619.
1825 2400etc/i Modem *(w/9600 SendFax)* ... 139.
9620 9600etc/e Modem ..... 379.
3080 Stereo•F/X..... 149.
3076 VGA Stereo•F/X *(w/512K, upgrd. to 1 MB)* 329.

Boca Research ... 5 years
7001 BOCARAM/AT PLUS *(0K)*..... 119.
7150 BOCARAM/AT PLUS *(2 MB)*..... 219.
7139 *(4 MB)* .... 329. 7138 *(8 MB)* .... 539.
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6999 I/O Board for Microchannel *(S/S/P)*..... 109.
8380 BasicVGA *(256K, 640 x 480)* ..... 63.
8381 SuperVGA *(1 MB, 1024 x 768)* ..... 145.
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Bravo Communications ... 2 years
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8578 Creative Labs Sound Blaster..... 115.
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2357 LQ-1170 *(136 col., 330 cps)* ..... 669.
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9884 Pocket Edition 2400 ..... 125.

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1637 Snap-In 386 *(for PS/2 50/60)* ..... 389.
3358 Power Pak *(Snap-In 386 & Above Board Microchannel 4 MB)* ..... 925.

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5409 80387-33 *(80386DX CPU's)* ..... 219.

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7899 Expert Mouse *serial* . 119. 7900 *bus* . 129.
3311 MasterStand ..... 59.

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2343 Trackman Portable ..... 105.
7975 ScanMan 256 ..... 289.
3295 MouseMan *(combo)* 75. 9766 *(cordless)* 89.

Megahertz ... 5 years
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1196 T224 2400 Modem *(for Toshiba Laptops)* 129.
1187 T324FM 96/24 Fax Modem *(Toshiba Lptps.)* 299.

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2763 MicroTRAC *(serial & PS/2 interface)* ..... 59.
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7271 *Inport* ..... 79. 6330 *PS/2* ..... 79.

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4071 1280i with 1 MB ..... 365.

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3491 Fontbank *(1.5 MB)* ..... 299.
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7055 *2 MB* ..... 145. 7759 *4 MB* ..... 259.
Memory upgrade for LaserJet II/IID:
6838 *2 MB* ..... 249. 6836 *4 MB* ..... 369.
8090 Pacific Connect with 1.25 MB ..... 349.
7158 Pacific Page PE 4.1 *(for LJ IIP/III)* ..... 379.
6834 Pacific Page *(for LJ II)* w/2 MB Mem. Brd. 379.
9833 Pacific Page XL *(w/accelerator board)* . . 799.

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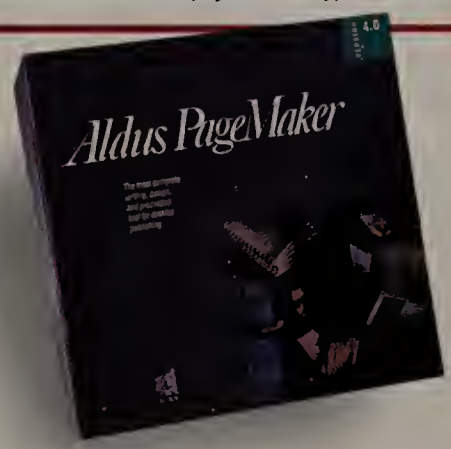

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2266	PM9600 Internal Modem	399.
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2264	PM2400FX96 *(modem/fax board)*	145.

Targus ... lifetime

1305	Universal Notebook *(for ntbk. computers)*	69.

TheComplete PC ... 2 years

8082	Half Page Scanner/400 w/ReadRight	289.
5828	TheComplete Communicator	319.
4316	TheComplete Fax Portable Plus	319.

Toshiba ... 1 year

3360	T2000SXE Notebook *(40 MB)*	3399.
3361	T2000SXE Notebook *(60 MB)*	3649.
1779	T3100SX Laptop *(80 MB)*	3199.
1773	T3200SX Laptop *(120 MB)*	3499.

Tripp Lite ... 2 years

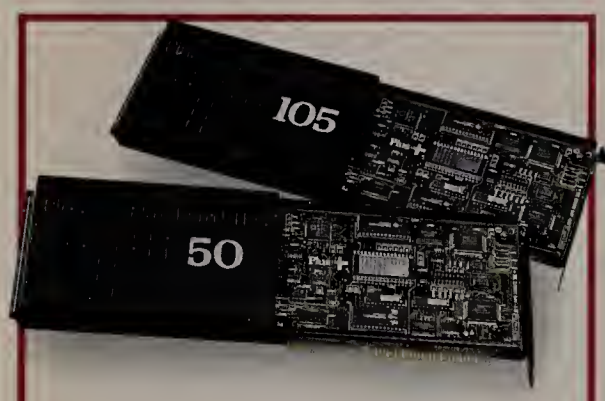
6199	Isobar 4-6 *(4 outlets, Gold Seal Warranty)*	49.
6200	Isobar 6-6 *(6 outlets, Gold Seal Warranty)*	59.
6201	Isobar 8-12 *(8 outlets, Gold Seal Warranty)*	69.
6018	LC1200 *(1200W line conditioner)*	159.

Video 7 ... 7 years

9768	VRAM II VGA 1 MB	329.

Zoom Telephonics ... 7 years

1307	Int. 2400 Baud w/9600 Baud Fax Modem	109.
1178	Ext. 2400 Baud w/9600 Baud Fax Modem	119.
1181	2400 Baud V.42bis Modem *(2 year)*	129.
1167	2400 Baud Internal Modem	65.
1166	2400 Baud External Modem	75.
3075	9600 V.32 Turbo Internal Modem *(2 yr.)*	399.
4400	24/96 Internal Fax Modem w/Winfax Pro	155.
4401	24/96 External Fax Modem w/Winfax Pro	159.



Quantum ... 2 years
Plus Hardcard II XL–Add a super-fast 50 MB or 105 MB hard drive to any 286/386 system. Anyone can install in just minutes. *New low price!*
8304 Plus Hardcard II XL 50 ..... $299.
8287 Plus Hardcard II XL 105 ..... 449.

DRIVES

Conner Peripherals ... 1 year

8875	CP3044 40 MB IDE HD *(25 ms)*	219.
2339	CP30104 120 MB IDE HD *(19 ms)*	399.
1337	CP3204 200 MB IDE HD *(16 ms)*	599.

IOMEGA ... 1 year
We are an authorized Iomega Service Center.

2224	Bernoulli II Transportable 90 MB	799.
2616	Internal 90 MB Bernoulli	799.
2500	PC2B Controller	199.
2530	90 MB Cartridge	149.
2467	90 MB Cartridge Tripak	439.

Mountain Network Solutions ... 2 years

2917	40-60 MB Internal Tape Drive	259.
5190	DC2000 Pre-formatted Cartridges ea.	35.
6153	DC2120 Tape Cartridge *(5 pack)*	149.

Pacific Rim ... 1 year

1304	1.2 MB External *(for any parallel port)*	239.
6602	1.44 MB External *(for PC/XT/AT)*	239.

Quantum ... 2 years

8304	Plus Hardcard II XL 50 MB *(9 ms)*	$299.
8287	Plus Hardcard II XL 105 MB *(9 ms)*	449.
4060	105 MB Drive Kit for MC PS/2's *(13 ms)*	789.

Seagate ... 1 year

4554	40 MB Internal HD ST251-1 *(28 ms)*	249.
1321	ST157A 40 MB IDE Hard Drive	229.
1320	ST1144A 130 MB IDE Hard Drive	459.

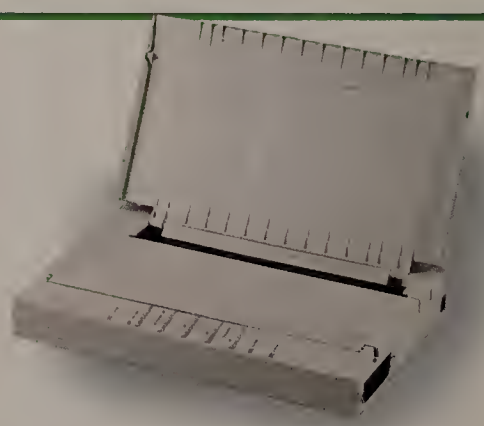
TEAC ... 1 year

4670	1.44 MB Drive for PC/XT *(3½")*	69.
4326	1.44 MB Drive for AT *(3½", w/Basetech)*	89.
4951	720k Drive for PC/XT *(3½")*	69.
6951	1.2 MB Drive for AT *(5¼")*	75.

MEMORY

6556	256k DRAM *(100 ns, set of 9)*	call
5510	1 MB x 9 SIMMs *(80 nanosecond)*	call
2497	4 MB x 9 SIMMs *(80 nanosecond)*	call
5746	1 MB Chips *(80 ns, set of 9)*	call
7813	256K x 4 Chips	call

Zoom Telephonics/Delrina Technology
Zoom 24/96 Fax Modem/Delrina Winfax Pro Bundle–Get this great 9600 bps send/receive fax with 2400 baud modem along with Delrina's Winfax Pro at a special price. Offer good thru 1/31/92.
4400 Int. Bundle $155. 4401 Ext. Bundle $159.



Canon ... 1 year
7894 *BJ-10ex Printer*–New enhanced version of the popular 4.6 lb. printer provides laser-like print quality (up to 360 dpi) on plain bond paper, envelopes or transparencies. Available in white or gray ..... $339.

DISKS/MEDIA

Maxell ... lifetime

2790	5¼" MD2-D 1.2 MB Diskettes *(Qty. 10)*	13.
2792	3½" DS/DD 720k Diskettes *(Qty. 10)*	11.
2793	3½" DS/HD 1.44MB Diskettes *(Qty. 10)*	19.

Sony ... lifetime

3291	5¼" DS/DD 360k Disks *(Qty. 10)*	7.
3297	3½" DS/DD 720k Diskettes *(Qty. 10)*	9.
3298	3½" DS/HD 1.44 MB Diskettes *(Qty. 10)*	16.
6148	3½" DS/DD *(3 Pack)*	$25.
6375	3½" DS/HD *(3 Pack)*	45.
8185	QD2040 Tape Cartridge	15.
1895	QD2120 Tape Cartridge	22.
6715	QD6150 Tape Cartridge	23.

3M ... lifetime

3943	DC 2000 Tape Cartridge	18.
3944	DC 600 Tape Cartridge	29.
5679	DC 6150 Tape Cartridge	29.

OUR POLICY

- We accept VISA and MASTERCARD only.
- No surcharge added for credit card orders.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order (in the U.S.).
- No sales tax, except Ohio residents (please add applicable tax).
- All U.S. shipments insured; no additional charge.
- APO/FPO orders shipped 1st Class Mail.
- International orders U.S. $250 minimum. Manufacturer support and upgrade eligibility may be limited outside the U.S.A.
- Upon receipt and approval, personal and company checks clear the same day for immediate shipment of your order.
- COD max. $1000. Cash, cashier's check, or money order.
- 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items subject to availability. Prices and promotions subject to change without notice.
- To order, call us Monday through Friday 8:00 a.m. to 1:00 a.m., or Saturday 9:00 a.m. to 5:30 p.m. Eastern Time. You can call our business offices at 603/446-3383 Monday through Friday 9:00 a.m. to 5:30 p.m.

IOMEGA ... 1 year
2224 Bernoulli II Transportable 90 MB–Rugged and built to last, this drive will absorb 1000 g's of shock and provide 90 MB of portable storage. Awards from *Byte* and *InfoWorld*. Requires adapter card ..... $799.

SHIPPING

Note: Accounts on net terms pay actual shipping.

Continental US:
- For heavy hardware items such as printers, monitors, Bernoulli Boxes, etc. pay actual charges. Call for UPS 2nd-Day & Next-Day-Air.
- For all other items, add $3 per order to cover UPS Shipping. For such items, we automatically use Airborne Express at no extra charge if you are more than 2 days from us by UPS ground.

Hawaii:
- For monitors, printers, Bernoulli Boxes, computers, hard drives, and power backups, actual UPS Blue charge will be added. For all other items, add $3 per order.

Alaska and outside Continental US:
- Call 603/446-7721 for information.

SETH JABEN

fonts

You don't need a PostScript printer to get great-looking fonts. Use this guide to 101 font cartridges and software packages to create documents dressed to impress.

CATHERINE SMITH

Fonts are like clothes—you can't go to work without them. And just as you wouldn't wear the same outfit to the office, the company picnic, and the formal awards dinner, you wouldn't want to use the same font for every print job.

Fonts that are acceptable for drafting a report may look amateurish when used in a presentation, may be wholly incompatible with spreadsheets, and can become illegible when transmitted by fax. Most of us need at least three sets of fonts: one for reports and correspondence, another for presentations or desktop published documents, and a third for squeezing big spreadsheets onto 8½-by-11-inch pages.

Where can you find the fonts you need? You can start with your printer. All printers come with built-in (or *resident*) fonts. (In this case, *font* refers to a typeface in a specific size, style, and weight, such as 10-point Helvetica Bold Italic.) Any application that supports, say, the LaserJet Series II enables you to select any of the fonts residing in that printer. Trouble is, most printers offer only a handful of fonts, not enough to produce the variety of documents required by a typical business.

The leading exceptions are printers that feature PostScript, Adobe's sophisticated page description language. PostScript printers are supported by the majority of applications, and most come with at least 35 typefaces that you can scale to any size. If you can afford $2000 or more for a PostScript printer, buy one and simplify your font choices. (For a review of nine low-cost PostScript printers, see "PostScript Lasers," December 1991.) If $2000 is too steep, the only way to get the fonts your printer lacks is to purchase them separately. They come in three basic varieties.

►*Bit-mapped soft fonts* come on disk and have fixed point sizes. To print a report in, say, 10-point Goudy Old Style, you need to install that font on your hard disk for the application you're using. The application then sends (*downloads*) the font to the printer when you print your document. Bit-mapped fonts hog disk space and take time to download, but you can buy them for almost any application and they work with almost any printer.

►*Scalable soft fonts* are created by software programs called *font generators*. Instead of having fixed point sizes, scalable fonts come in *outlines* that you can stretch to virtually any size. For example, using a Goudy Old Style outline, you can generate fonts in 9 points, 99 points, or 999 points. Font generators work with most printers, but only *Windows* and a handful of DOS programs can benefit from them.

►*Font cartridges* plug into your printer. (In this guide, we've listed the industry standard, cartridges for the HP LaserJet.) Most cartridges contain bit-mapped fonts, though some contain scalable outlines and come with their own built-in font generators. Some applications come with special drivers that "talk" to individual cartridges, letting you use all the fonts therein.

All three font products can provide the typefaces you need. Your choice depends on the number and types of fonts you want, your budget, and compatibility with your application and printer.

Software-based fonts offer the widest range of font options and the broadest printer support, from dot matrices and ink jets to lasers.

Bit-Mapped Soft Fonts Bit-mapped soft fonts have been largely supplanted by cartridges and scalable-font generators. If neither of these works with your printer or application, bit-mapped soft fonts are your last hope.

Most bit-mapped font packages support top-selling DOS applications like *WordPerfect*, *Harvard Graphics*, and *1-2-3*. You're sure to find others that work with applications the font generators ignore. All are compatible with the LaserJet II and III, but support for other printers is spotty.

Bit-mapped typefaces come in discrete sizes and require plenty of disk space, so you usually get only a handful in each package. Most vendors offer a library of typefaces, but none let you add faces from other manufacturers.

Since creating a document without screen fonts is like getting dressed in the dark, look for font packs that come with *Windows* or *Ventura* screen fonts. These must be installed separately, but they enable you to see your pages before you print them.

Scalable Soft Fonts Scalable font outlines are like elastic waistbands—they stretch to fit your needs. Each font outline lets you create thousands of individual fonts, giving you the most bang for your buck. For the widest choice of fonts and the broadest printer support, go with a scalable-font package.

If you use an offbeat application, though, you may be out of luck. Most scalable-font generators work with *Windows* and the major word processors but few other DOS applications. You may need to find a bit-mapped package.

If you own a dot matrix or ink jet printer and need PostScript output, emulators are your only solution.

Most of the scalable-font packages listed here come with their own font generation software. You select the typeface and size, and the program creates the fonts. Other packages let you download scalable font outlines to the LaserJet III, which has a built-in font generator that works much the same way.

Since these fonts are scalable, font style is a bigger issue than font size. Fortunately, you have plenty of font options to choose from—literally thousands of additional typefaces from a variety of vendors. Moreover, the top scalable packages also provide screen fonts that are generally superior to those of their bit-mapped cousins.

Windows aficionados should note that version 3.1 will ship with its own on-the-fly font manager and 13 scalable TrueType outlines. These may be all the fonts many users will need. Several third-party vendors have announced their support for TrueType add-on fonts, but none were shipping at press time.

PostScript emulators are scalable-font packages cut from a different cloth. In addition to fonts, they enable you to produce complex PostScript graphics on almost any printer. If you own a dot matrix or ink jet model and need PostScript output, emulators are your only solution.

However, because the PostScript files are processed inside your computer, not the printer, you'll need a lot of horsepower. In addition to at least 1.5MB of printer RAM, a 386 with 4MB of RAM and a math coprocessor are usually recommended. But even then, don't expect performance to match that of a laser printer with built-in PostScript.

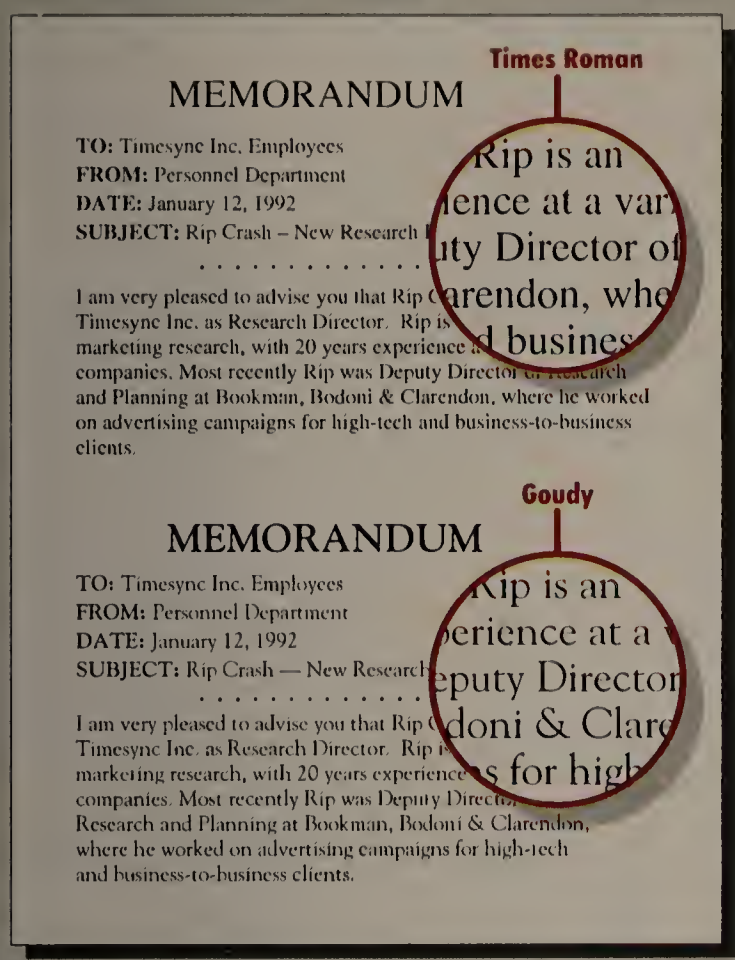
Most packages offer inexpensive starter kits with 13 scalable outlines or the full set of 35. Font for font, these emulators are cheaper than most scalable-font packages—provided you already own the necessary hardware.

Font Cartridges The great appeal of font cartridges is their simplicity. Just stick one into the slot in your laser, install the proper driver for your software program, and you're ready. Cartridges are generally faster than soft fonts and make it easier to standardize your work group on one set of fonts. But they're also less flexible: You'll get fewer add-on font options, and ink jet and dot matrix printers accept only proprietary cartridges.

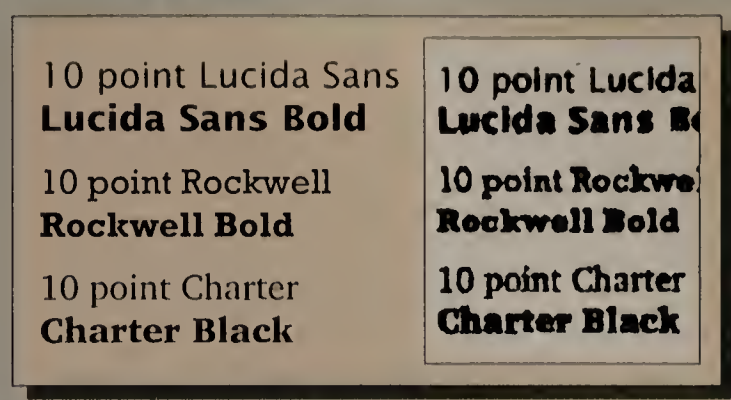
Bit-Mapped Cartridges Like their soft font siblings, bit-mapped cartridges offer a limited number of typefaces in fixed sizes. But when it's time to add fonts, your options are few. Bitstream's Type City and Elite's 25 Plus/Charisma let

About Face

It's not how many fonts you have but which you use that determines how effective your document is. Here are some suggestions for matching the fonts you have to the documents you need to produce.



Reports, memos, and correspondence look best in an easy-to-read classic typeface, such as Times Roman or Goudy. The most effective reports use a minimum of type styles, though italics and boldface work well to highlight key points.



Faxes present their own special dilemma: Type tends either to break up or to spread out when faxed. A medium-weight typeface such as Adobe's Lucida Sans, Rockwell, or Bitstream's Charter, in an appropriate size—10 point is okay, but 12 or 14 point is better—stays readable even after the fax machine has done its worst.

Presentations demand simplicity, and a thick, modern, sans serif face like Futura Extra Black fills the bill. An easy-to-read serif face, such as Century, is a good choice for secondary type, but don't use more than two typefaces.

Newsletter typefaces are typically based on content: Idiosyncratic faces may make sense for informal, in-house efforts, whereas professional business publications require a more dignified face. Because a newsletter's first mission is to capture the reader's attention, designers often mix type, using different faces for headlines, sidebars, and other elements.

FONT SOFTWARE

Manufacturer	Product	Price	Standard fonts	Font sizes (points)	Number of add-on typefaces	Supports third-party add-on fonts	PRINTER SUPPORT: IBM/Epson 24-pin dot matrix	HP DeskJet	HP LaserJet II/ HP LaserJet III
BIT-MAPPED SOFT FONTS [1]									
Data Transforms	Fontrix	$155	12	3–37	300	N	Y	Y	Y/Y
	Printrix	$165	23	3–37	300	N	Y	Y	Y/Y
Elfring Soft Fonts	Spread Sheet Font Set	$75	1	4–16	0	N	N	Y	Y/Y
	LaserJet Starter Package	$75	6	6–30	0	N	N	N	Y/Y
	Standard Text Fonts	$150	21	6–30	0	N	N	Y	Y/Y
	Tax Font	$65	3	6–14	0	N	N	N	Y/Y
Good Software	25 in 1 SoftCartridge	$130	100	6–18	15	N	N	N	Y/Y
K-Talk Communications	Greek Soft Fonts	$149	7	5–24	1	N	N	N	Y/Y
	Math Soft Fonts	$149	7	5–24	1	N	N	N	Y/Y
Metro Software	SuperFonts 25/1	$179	14	6–18	0	N	Y [2]	Y [2]	Y/Y
Weaver Graphics	LJ Fonts	$30	1	6–72	200	N	N	Y [2]	Y/Y
SCALABLE SOFT FONTS									
Adobe Systems	Adobe Type Library for the PC	$49–$370	4	4–999	1200	Y	Y [4]	Y [4]	Y/Y
	Adobe Type Manager	$99	13	4–999	1200	Y	Y	Y	Y/Y
	Adobe Type Sets	$99–$198	8–10	4–999	1200	Y	Y [4]	Y [4]	Y/Y
Agfa	Intellifont-for-Windows 3.0	free	8	4–999	200 [6]	Y	Y	Y	Y/Y
	Type Director 2.0	$99	8	4–999	200	Y	Y	Y	Y/Y
Atech Software	FastFonts (with Publisher's PowerPak)	$100	18	4–1000	234	Y	Y	Y	Y/Y
Bitstream	FaceLift for Windows	$99	13	4–500	24	N	Y	Y	Y/Y
	FaceLift 1.5 for WordPerfect	$99	16	4–500	200	N	Y	Y	Y/Y
Cosady & Greene	Fluent Laser Fonts Library	$190	79	4–999	n/a	n/a	Y [6]	Y [6]	Y [6]/Y [6]
Digi-Fonts	Digi-Fonts Typestyles	$80	8	4–720	405	N	N	N	Y/Y
	Digi-Fonts Typeface Library	$600	264	4–720	405	N	N	N	Y/Y
Elfring Soft Fonts	KeyCaps Font Set [7]	$75	4	8–18	0	N	N	Y	Y/Y
	Font Packs 1, 2, 3, 4, and 5 [7]	$65 [8]	4	8–30	0	N	N	Y	Y/Y
The Font Company	The Font Company Type Library	$50–$170	1–4	4–999	1600	N	Y [4]	Y	Y/Y
Glyph Systems	Typographer 2.0	$99	4	4–400	1700	N	Y	Y	Y/Y
Hewlett-Packard	HP Brilliant Presentations 1	$159	3	4–999	[9]	Y	Y	Y	Y [10]/Y
	HP Compelling Publications 1	$159	3	4–999	[9]	Y	Y	Y	Y [10]/Y
	HP Compelling Publications II	$159	3	4–999	[9]	Y	Y	Y	Y [10]/Y
	HP Decorative Words 1	$159	9	4–999	[9]	Y	Y	Y	Y [10]/Y
	HP Distinctive Documents 1	$159	3	4–999	[9]	Y	Y	Y	Y [10]/Y
	HP WordPerfect Scalable Typefaces	$249	10	4–999	[9]	Y	Y	Y	Y [10]/Y
	Premier Collection with Type Director 2.0	$195	6	4–999	[9]	Y	Y	Y	Y [10]/Y
LaserTools	Fonts-on-the-Fly	$149	19	4–200	0	Y	Y	Y	Y/Y
MicroLogic	MoreFonts	$150	24	4–999	74	Y	Y	Y	Y/Y
Power Up	Express Fonts	$80	2	6–144	0	Y	Y	Y	Y/Y
	TextAppeal	$130	13	6–144	0	Y	Y	Y	Y/Y
SoftCraft	Font Solution Pack	$495	11	4–240	200	Y	Y [2]	N	Y/Y
SWFTE	Glyphix Laser Fonts for WordPerfect	$100	11	4–120	45	N	N	Y	Y/Y
Zenographics	SuperPrint 2.0	$195	35	4–999	[9]	Y	Y	Y	Y/Y
ZSoft	SoftType 1.1	$199	63	4–72	1000 [6]	Y	Y	Y	Y/Y
POSTSCRIPT EMULATORS									
Custom Applications	Freedom of Press	$495	35	4–999	1000 [6]	Y	Y	Y	Y/Y
	Freedom of Press Professional	$1495	35	4–999	1000 [6]	Y	Y	Y	Y/Y
	Freedom of Press for Windows 3.0	$495	35	4–999	1000 [6]	Y	Y	Y	Y/Y
LaserGo	GoScript	$149	13	4–999	100	Y	Y	Y	Y/Y
	GoScript Plus	$299	35	4–999	100	Y	Y	Y	Y/Y
	GoScript Select	$99	13	4–999	100	Y	N	Y	Y/Y
PMWare	UltraScript PC 3.0	$195	25	4–999	1000 [6]	Y	Y	Y	Y/Y
	UltraScript PC Plus 3.0	$449	47	4–999	1000 [6]	Y	Y	Y	Y/Y

[1] Point size varies with printer resolution.
[2] Requires extra-cost utility.
[3] Only for specific characters.
[4] Requires Adobe Type Manager for Windows.
[5] Screen fonts generated by using Adobe Type Foundry.
[6] Via Adobe Type Manager (included in package).
[7] Available in bit-mapped, PostScript, PCL 5 Scalable, and TrueType formats.

APPLICATION SUPPORT						SCREEN FONTS		
Windows 3.0	Ventura (GEM/ DOS)	Word-Perfect (DOS)	Word (DOS)	1-2-3 (DOS)	Harvard Graphics (DOS)	Windows	Ventura (GEM/ DOS)	Reader service number
N	N	Y	Y	Y	N	N	N	620
N	N	Y	Y	Y	N	N	N	620
Y	Y	Y	Y	Y	Y	Y	Y	621
Y	Y	Y	Y	Y	Y	Y	Y	621
Y	Y	Y	Y	Y	Y	Y	Y	621
Y	Y	Y	Y	Y	Y	Y	Y	621
Y	Y	Y	Y	Y	Y	N	N	622
Y	N	Y	N	N	N	Y	N	623
Y	N	Y	N	N	N	Y	N	623
N	Y	Y	Y	Y	Y	N	Y	624
Y	Y	Y	Y	Y	N	Y[3]	Y[3]	625
Y	Y	Y	Y	N	N	Y[5]	Y[5]	626
Y	N	N	N	N	N	Y	N	626
Y	Y	Y	Y	N	N	Y[5]	Y[5]	626
Y	Y	Y	Y	Y	Y	Y	Y	627
Y	Y	Y	Y	Y	Y	Y	Y	627
Y	N	Y	Y	N	N	Y	N	628
Y	N	N	N	N	N	Y	N	629
N	N	Y	N	N	N	N	N	629
Y[6]	N	N	N	N	N	Y[6]	N	630
Y[2]	Y[2]	Y[2]	Y[2]	N	N	Y[2]	Y[2]	631
Y[2]	Y[2]	Y[2]	Y[2]	N	N	Y[2]	Y[2]	631
Y	Y	Y	Y	Y	Y	Y	Y	632
Y	Y	Y	Y	Y	Y	Y	Y	632
Y[4]	Y	N	Y	N	N	Y[4]	N	633
Y	Y	Y	Y	N	N	Y	Y	634
Y	Y	Y	Y	Y	Y	Y[10]	Y[10]	635
Y	Y	Y	Y	Y	Y	Y[10]	Y[10]	635
Y	Y	Y	Y	Y	Y	Y[10]	Y[10]	635
Y	Y	Y	Y	Y	Y	Y[10]	Y[10]	635
Y	Y	Y	Y	Y	Y	Y[10]	Y[10]	635
Y	Y	Y	Y	Y	Y	Y[10]	Y[10]	635
Y	Y	Y	Y	Y	Y	Y[10]	Y[10]	635
N	N	Y	N	N	N	N	N	636
Y	Y	Y	Y	N	N	Y	Y	637
Y	N	N	N	N	N	N	N	638
Y	N	Y	Y	N	Y	Y	N	638
Y	Y	Y	Y	Y	N	Y	Y	640
N	N	Y	Y	N	N	N	N	641
Y	N	N	N	N	N	Y	N	642
Y	Y	N	N	N	N	Y	Y	643
Y	Y	Y	Y	Y	Y	Y	Y	644
Y	Y	Y	Y	Y	Y	Y	Y	644
Y	Y	Y	Y	Y	Y	Y	Y	644
Y	Y	Y	Y	N	Y	N	N	645
Y	Y	Y	Y	N	Y	N	N	645
Y	Y	Y	Y	N	Y	N	N	645
Y	Y	Y	Y	Y	Y	N	N	646
Y	Y	Y	Y	Y	Y	N	N	646

[8] Font packs available separately.
[9] Vendor unable to estimate total number.
[10] Requires Agfa Type Director or Intellifont-for-Windows.

For more information about all products in this table, circle reader service no. 902.

you plug credit card–size font cards into the cartridge itself for mix-and-match customization. With the rest, you have to buy another cartridge if you want more fonts.

Bit-mapped cartridges can work with the LaserJet II or III. All the cartridges listed here support *Windows*, *Microsoft Word*, and *WordPerfect*, but support for other applications varies. If the cartridge doesn't support the HP standard, you may have to install special drivers to make it work with your application.

Finally, to avoid a lot of trial and error at print time, look for cartridges for which there are matching screen fonts.

Scalable Cartridges Scalable cartridges offer the same advantages as scalable soft fonts. However, many work only with the LaserJet III, and your add-on options are limited. Only Pacific Data's FontBank is fully customizable. Download your favorite scalable or bit-mapped soft fonts into the cartridge to combine the speed and convenience of cartridges with the flexibility of soft fonts.

LaserJet Series II owners can also feed their scalable-font needs via a PostScript cartridge. These cartridges work with either species of LaserJet, and they're generally cheaper than other cartridges on a per-font basis. However, they require at least 1.5MB of printer RAM, and that can slow your laser to a crawl.

Choosing Well Selecting the best font options doesn't have to be confusing. If you need the widest possible font assortment, your best bet is scalable-font software. But when you're sharing a laser, a cartridge is a simpler and faster option.

LASERJET FONT CARTRIDGES

Manufacturer	Product	Price	Standard fonts	Font sizes (points)	Accepts add-on fonts	Supports HP LaserJet II/ LaserJet III	APPLICATION SUPPORT Ventura (GEM/ DOS)	1-2-3 (DOS)	Harvard Graphics (DOS)
BIT-MAPPED CARTRIDGES									
Architext	ArcArtist	$250	19	6–36	N	Y/Y	N	N	Y
	ArcMoil	$175	6	1.94–20	N	Y/Y	N	N	Y
	BarCode Set	$225	9	9.5–12	N	Y/Y	N	N	Y
	Fixed Pitch Set	$175	8	8	N	Y/Y	N	N	Y
	ProTax	$250	8	6–14	N	Y/Y	N	N	Y
	TagIt	$365	5	18–204	N	Y/Y	N	N	Y
	WildCard	$365	246	3.6–18	N	Y/Y	N	N	Y
Bitstream	Type City	$379	35	8–60	Y	Y/Y	N	N	Y
Computer Peripherals	Action Set	$175	21	3–18	N	Y/Y	Y	Y	Y
	SuperSet +	$349	23	3–18	N	Y/Y	Y	Y	N
Elite	25 Plus/Charisma	$399	150	4–30	Y	Y/Y	Y	Y	Y
Hewlett-Packard	HP Forms, Etc.	$195	9	6–24	N	Y/Y	N	Y	Y
	HP Global Text	$195	6	8–14	N	Y/Y	N	Y	Y
	HP International Collection	$325	14	3.6–14	N	Y/Y	N	Y	Y
	HP Microsoft	$195	30	8–14	N	Y/Y	N	Y	Y
	HP Persuasive Presentations	$195	17	14–24	N	Y/Y	N	Y	Y
	HP Polished Worksheets	$195	8	3.6–12	N	Y/Y	N	Y	Y
	HP Pretty Faces	$195	9	14–54	N	Y/Y	N	Y	Y
	HP ProCollection	$300	65	3.6–12	N	Y/Y	N	Y	Y
	HP Tax1	$195	7	6–14	N	Y/Y	N	Y	Y
	HP Text Equations	$195	8	7–10	N	Y/Y	N	Y	Y
	HP WordPerfect	$195	18	6–24	N	Y/Y	N	Y	Y
IQ Engineering	Super Cartridge 1 Int'l Edition	$399	19	4–16	N	Y/Y	N	Y	N
	Super Cartridge 2	$399	17	4–30	N	Y/Y	Y	Y	N
Lotus Selects	Super Cartridge	$399	14	4–14	N	Y/Y	N	Y	Y
Pacific Data Products	25 in One	$399	12	3.6–18	N	Y/Y	Y	Y	Y
	Headlines in a Cartridge	$299	2	14–48	N	Y/N	Y	Y	Y
PCPI	Collection	$199	24	6–24	N	Y/Y	Y	N	N
	Forms Plus	$149	20	6–24	N	Y/Y	Y	N	N
	Heritage	$299	30	6–24	N	Y/Y	Y	N	N
	ImageFont All-in-One	$299	20	6–24	N	Y/Y	Y	N	N
	Perfect	$149	28	6–24	N	Y/Y	Y	N	N
	Presentation	$149	24	14–24	N	Y/Y	Y	N	N
	Publication	$299	30	6–24	N	Y/Y	Y	N	N
	Starter	$99	14	3.6–11	N	Y/Y	Y	N	N
	Technical	$149	12	7–10	N	Y/Y	Y	N	N
	Ventura Publisher	$299	24	6–24	N	Y/Y	Y	N	N
	Word	$149	12	8–14	N	Y/Y	Y	N	N
	Worksheets	$149	10	3.6–16	N	Y/Y	N	Y	N
SCALABLE CARTRIDGES									
Hewlett-Packard	HP Brilliant Presentations 1 and Compelling Publications II	$349	8	4–999	N	N/Y	N	Y	Y
	HP Distinctive Documents 1 CPI	$349	7	4–999	N	N/Y	N	Y	Y
	HP PCL 5 Cartridge	$299	6	4–999	N	Y/N	Y	Y	Y
	HP WordPerfect Scalable Typefaces	$349	10	4–999	N	N/Y	N	Y	Y
IQ Engineering	Super Cartridge 3/Professional Edition	$399	40	4–999	N	N/Y	Y	Y	N
Pacific Data Products	Complete Font Library Cartridge	$399	51	25–999	N	N/Y	Y	Y	N
	FontBank Cartridge [1]	$299	[2]	[2]	Y	Y/Y	Y	[3]	[3]
POSTSCRIPT									
Adobe Systems	PostScript Cartridge for LaserJet II	$495	35	4–999	N	Y/Y	Y	N	N
Computer Peripherals	JetPage III	$349	47	4–999	N	Y/Y	Y	Y	Y
Elite	PowerScript IV	$599	47	4–999	Y	Y/Y	Y	Y	Y
Pacific Data Products	PacificPage PE	$499	35	2–999	N	Y/Y	Y	Y	Y
PCPI	ImageScript for Series II	$299	47	4–999	N	Y/N	Y	N	Y
	ImageScript for HP IID, IIP, IIIP, III	$299	47	4–999	N	Y/Y	Y	N	N

[1] Customizable font cartridge; may contain scalable fonts or bit maps.
[2] Varies.
[3] Not supported at press time.
[4] Requires Adobe Type Foundry utility.
[5] Uses standard PostScript printer driver.

SCREEN FONTS

Windows	Ventura (GEM/DOS)	Uses HP driver(s)	Reader service number
Y	N	Y	647
Y	N	Y	647
Y	N	Y	647
Y	N	Y	647
Y	N	Y	647
Y	N	Y	647
Y	N	Y	647
Y	N	Y	648
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Y	N	N	650
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N	N	N	655
Y	Y	Y	656
Y	Y	Y	656
Y	Y	Y	656
Y	Y	Y	656
Y	Y	Y	657
Y	N	N	658
Y	Y	N	658
Y[4]	Y[4]	[5]	659
N	N	[5]	660
Y	N	[5]	661
Y	Y	[5]	662
Y	Y	[5]	663
N	N	[5]	663

Scalable-font packages are a cost-effective option for lasers, and they're your best option for outfitting ink jet and dot matrix printers. If your applications aren't supported by a scalable-font generator, bit-mapped soft fonts are a reasonable choice.

Some final caveats: Before you buy, be aware that similar typefaces often come with different labels. For example, Swiss and San Marcos are Helvetica knockoffs. Always examine print samples to gauge quality and make sure you're not buying fonts you already own. And remember that owning a lot of fonts doesn't mean you have to use them all in one document.

Catherine Smith is a freelance writer in San Diego.

WHERE TO BUY

Adobe Systems, Inc.
1585 Charleston Rd.
P.O. Box 7900
Mountain View, CA
94039-7900
800/235-0078

Agfa Corp.
90 Industrial Way
Wilmington, MA 01887
800/424-8973,
508/658-5600

Architext Inc.
121 Interpark Blvd. #208
San Antonio, TX 78216-1808
512/490-2240,
512/490-2242 (fax)

Atech Software
5964 La Place Ct. #125
Carlsbad, CA 92008
800/786-3668,
619/438-6898 (fax)

Bitstream Inc.
215 First St.
Cambridge, MA 02142
800/522-3668,
617/497-6222

Casady & Greene, Inc.
22734 Portola Dr.
Salina, CA 93908
800/359-4920,
408/484-9228

Computer Peripherals, Inc.
667 Rancho Conejo Blvd.
Newbury Park, CA 91320
800/854-7600,
805/499-5751

Custom Applications, Inc.
900 Technology Park Dr.
Billerica, MA 01821
800/873-4367,
508/667-8821 (fax)

Data Transforms
616 Washington St.
Denver, CO 80203
303/832-1501

Digi-Fonts, Inc.
528 Commons Dr.
Golden, CO 80401
800/242-5665,
303/526-9502 (fax)

Elfring Soft Fonts
P.O. Box 61
Wasco, IL 60183
708/377-3520,
708/377-6402 (fax)

Elite Business Applications, Inc.
P.O. Box 300
Millersville, MD 21108
800/942-0018,
301/987-7200

The Font Company, Inc.
7850 E. Evans #111
Scottsdale, AZ 85260
800/442-3668,
602/998-9711

Glyph Systems, Inc.
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MicroLogic Software Inc.
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Pacific Data Products
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619/552-0889 (fax)

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800/262-0522 California,
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619/738-6633

Power Up Software Corp.
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415/345-0551

SoftCraft, Inc.
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800/351-0500,
608/257-6733 (fax)

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Rocklind, DE 19732
800/237-9383,
302/234-1740

Weaver Graphics
5165 S. Highway A1A
Melbourne Beach, FL
32951
407/728-4000,
407/728-5978 (fax)

Zenographics
4 Executive Cir.
Irvine, CA 92714
714/851-6352,
714/851-1314 (fax)

ZSoft Corp.
450 Franklin Rd. #100
Marietta, GA 30067
404/428-0008,
404/427-1150 (fax)

MANAGER'S GUIDE

Alan Kaplan

The gap between what PC managers want to do and can do is closing, thanks to an approach called "object-oriented programming." OOP has arrived not a moment too soon for nonprogramming managers who depend on many programs working together—say, for creating reports from multiple, often remote, data bases. Such tasks may involve a half-dozen or more programs for communications, data base access, spreadsheet consolidation, presentation graphics, word processing, and desktop publishing. Getting all these programs to work reliably is difficult; getting them to work seamlessly can be impossible.

The problem is complexity. Today's meat-and-potatoes applications now run over 200,000 lines of code. Given the average programmer's daily output of 10 to 15 lines, new versions of programs designed to take advantage of the latest hardware and environments can fall years behind schedule. Complexity is the reason 35 million business PC users give software bad marks for lateness and unreliability. Complexity also happens to be just what OOP addresses.

What's OOP?

Nonprogramming managers don't need to understand *how* OOP does what it does. "But," says Joe Byrd, manager of Borland International's Visions Video operation, "unless users appreciate *what* OOP does, they'll not see what it can do for

LANCE JACKSON

to the NEW SOFTWARE

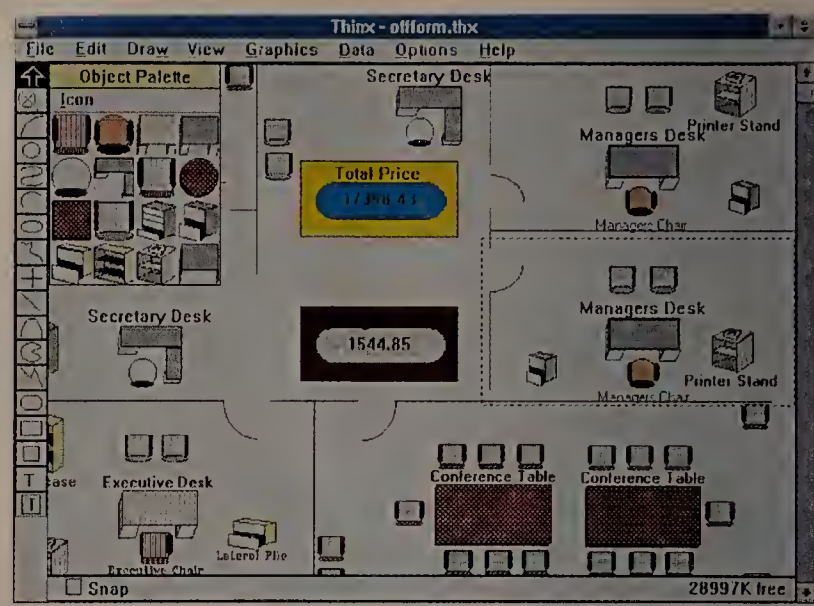
Object-Oriented Programs Are Making Applications More Powerful and Less Complex

them, what they should expect from OOP-developed programs." Those expectations, says Byrd, include programs that are more robust, easier to maintain, able to incorporate new features more easily, and less expensive.

OOP is based on modular structure, top-down organization, and abstraction. The programmer defines "objects," which can be anything acted upon: screens, data tables, graphic elements. Objects are given attributes (like color and size) and behaviors (permitted actions like "display"). Thus objects are defined by what they *do* as well as by what they are, as in human language: a chair (object) is an article of furniture ("class" or "structure") that supports ("behavior") a sitting person. Objects can be abstracted into broader classes (chairs into furniture), or subclasses ("thrones" or "beach chairs"). Each class can be ascribed different attributes (thrones are *larger* than beach chairs) and behaviors (beach chairs *fold*).

The approach is intuitive and simple, but the implementation is new because, unlike human languages, programming languages—the languages used by program developers—did not naturally support object structures. Because data was separated from the way it was used, one needed intimate knowledge of how data was represented as words, pictures, or sounds. Otherwise one might try to display sound data as image, or treat music as text. And because data could not be abstracted, each use of that data required citing all of it. One could not, for example, refer to a chair except by describing its materials, size, design, and so on.

OOP development languages—the best known are Smalltalk, Actor, Simula, and C++—capitalize on the abstraction and manipulative features we take for granted in human



***Object-Oriented Applications* like Bell-Atlantic's *Thinx* visual data manager let users create objects that combine graphic and alphanumeric data. In this space-planning application, prices are assigned to various articles of furniture, and total cost is calculated as each article of furniture is selected for positioning.**

language that let us think conceptually, without the burden of implementation details. The remarkable power of those features has been wildly welcomed by developers. A recent article in *Computer Language,* a developer magazine, calls OOP "the hottest thing since jalapeño peppers."

Payoffs to Users

Developers must write programs before users can benefit from them, of course, and no individual company has championed the OOP cause within the DOS and *Windows* develop-

PHILIPPE KAHN'S OBJECT EXAMPLE: DBASE

How confident is Borland International's Philippe Kahn about object-oriented programming? "I bet the company on OOP three years ago," he says, when "it was a big gamble because it was unproven." How does he feel today? "I'm happy to report that my instincts were right —OOP has propelled Borland into a leadership position in software development."

No one who's watched Borland's rapid growth disputes that. Now Kahn's going after the last doubting Thomases by showing that OOP isn't just for new programs; it can be retro-fitted. "Everybody should switch to OOP," he says.

Borland's recent acquisition of Ashton-Tate, whose updates to its flagship *dBASE* have run more than a year late, gives Borland a superb test case. Says Kahn: "The industry knows that *dBASE* has been lacking in true technology innovation for some time. Borland is going to change this. The XBASE compiler that we have written is all Borland code—you'll see some significant improvements when this product is released. The best thing is that [Borland's] *Paradox* and *dBASE* will be able to share information via Borland's Object Layer technology, which provides access to a variety of file formats."

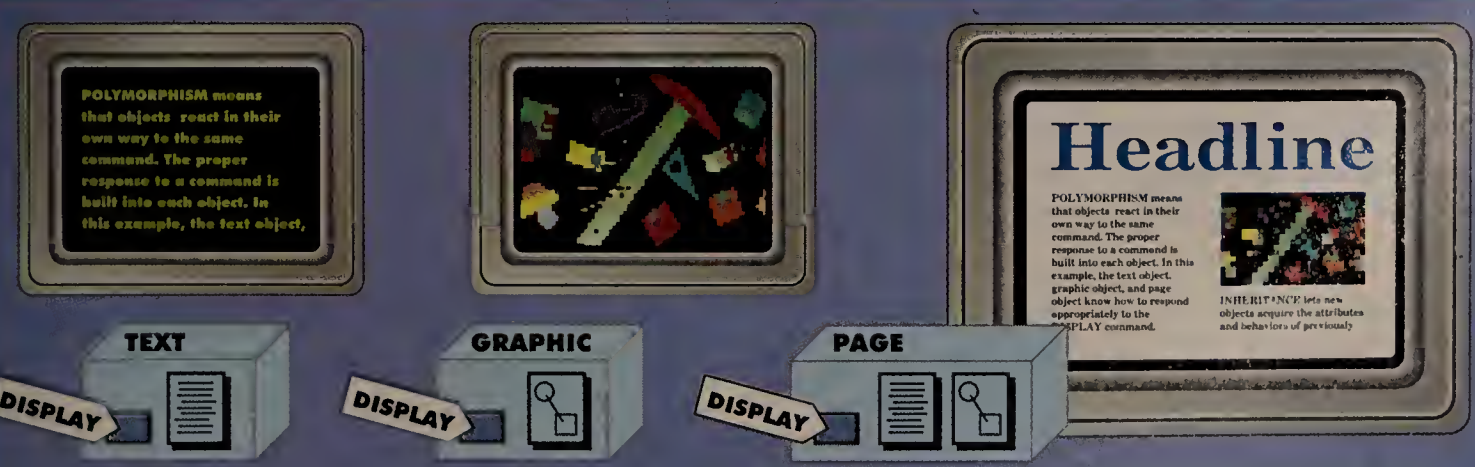
Whatever Borland's long-term plans for *dBASE,* users will check out its next version with great interest. "What Borland does with *dBASE* could be the best argument yet for OOP," says consultant John Murphy, president of Metro Computing in Gibbsboro, New Jersey. "A much-improved *Windows* version of *dBASE* would be an 'object example' of the worth of Borland's OOP development tools for older programs."

SPEAKING OF OBJECTS

Three object-oriented mechanisms in application software make programs more robust for users, and reduce development costs.

ENCAPSULATION, also called "data hiding," protects an object by restricting access to its inner workings, making sources of change easier to identify. Here anyone can drive the car, change tires, or open windows, but only mechanics can make changes to the engine and transmission.

INHERITANCE lets new objects acquire the attributes and behaviors of previously created objects. Since new objects don't have to be built from scratch, they're easier to create, and they act consistently. Thrones and beach chairs inherit chair attributes "backrest" and "sitting surface"; thrones add the attributes "massive" and "ornamented"; beach chairs add the behavior "folds."



POLYMORPHISM means that objects react in their own way to the same command. The proper response to a command is built into each object. In this example, the text object, graphic object, and page object know how to respond appropriately to the DISPLAY command.

ment community more vigorously than has Borland International. The company estimates that more than 400,000 copies of its Borland C++, Turbo C++, and object-oriented Turbo Pascal account for at least 80 percent of the market for personal computer OOP development languages.

In July, a Borland task force visited seven U.S. and seven foreign cities to deliver Borland's OOP productivity message and distribute a 21-minute elementary video, "The World of Objects," hosted by Borland chairman and CEO Philippe Kahn. That tape, directed at software managers, was the first in a series of tapes that now includes tutorials for programmers already versed in the popular C language. C programmers represent the key market for C++ and the reason C++ is the most popular PC OOP language.

Unfortunately for users looking for immediate improvements in all their favorite applications, the learning curve from C to C++ is steep. Borland estimates that while competent C programmers need only a month to learn the rudiments of C++, they need three to six months of practice before they'll be productive. Getting management's assent for that kind of investment in education is the point of Borland's "The World of Objects" tape.

Payoff from the conversion comes quickly, however. Maintenance accounts for up to 80 percent of the total manufacturing cost of procedural (non-OOP) software. OOP can cut those costs by more than 75 percent, a reduction that can translate to savings of more than 50 percent in the price that is paid by the final purchaser.

Users can expect additional savings in the cost software manufacturers pay to develop their programs. This results from the availability of such modular OOP tools as Data Techniques' *ImageMan Windows* library, which lets developers add display/print capabilities to their *Windows* applications without having to learn, and generate code for, the myriad of industry-supported graphics formats. Zylab's David Chwalisz estimates that adding *ImageMan*'s graphics modules to *ZyIndex*, Zylab's text/image retrieval program, reduced the time spent by 80 percent, not to mention "the pain of researching those formats." Chwalisz summarizes the OOP advantage: "Now I just 'open image' and pull in the object; I don't need to know its intimate details." Other well-known programs supported by *ImageMan* are the DOS shell *Xtree* and the *DataEase* data base program.

Not needing to know the details is, of course, the source of OOP's strength. Says David Intersimone, in charge of Borland's developer relations, "It's like using a telephone without having to know how it works." For users, Chwalisz's "open image" means grabbing and dragging an on-screen object without menu commands.

The telephone analogy holds for another promised user benefit: hardware independence. Objects are acted upon by messages, and the message sender only needs to know that the object will respond. Unisys' CTOS operating system is message-based, and David Mullins, product manager for operating systems at Unisys' Distributed Systems Division, sees OOP as "tremendously enhancing our ability to write programs across 80*x*86, RISC, Motorola, and other platforms." Mullins is currently overseeing a change to OOP. "It represents a complete mental shift in how one goes about developing programs, but we've found that those who cross over the learning curve are very productive."

AN OOP CHECKLIST FOR USERS

Getting answers to these questions before purchasing that next big application will increase your chance of being as pleased with your software tomorrow as you are today.

1) In what language is the application written? While object-oriented programs need not be written in object-oriented programming languages, use of an OOP language indicates the manufacturer/developer is aware of OOP benefits.

2) Does the manufacturer specifically reference OOP capabilities and support OOP standards such as those of the Object Management Group? Positive answers to this and the following questions indicates compatibility with other programs.

3) Is the program optimized for a graphic environment like *Windows*? Does it support Dynamic Data Exchange? Object Linking and Embedding? The *Windows* clipboard? The *Windows* help facility? The more "Yes" answers, the more likely you'll be satisfied with the program's multitasking capabilities now and later.

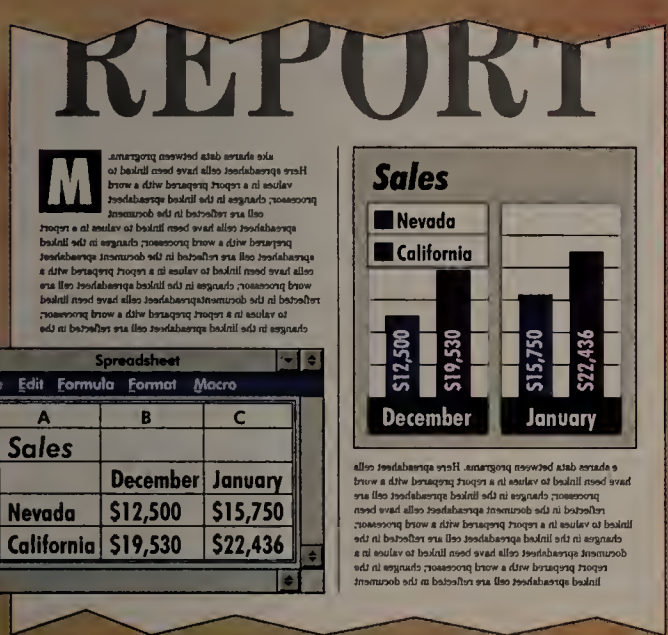
OLE: New Functionality for Users

Users can expect new levels of functionality as leading software companies expand their products' OO (object-oriented) capabilities. Like Unisys, Lotus Development used OO methods before languages supported OO structures. A mainframe version of C++ that Lotus acquired five years ago produced *IMPROV*, a next-generation spreadsheet for the NeXT computer. Today all but one of Lotus's development projects are being written in the C++ language.

For David P. Reed, vice president and chief scientist at Lotus Development, "Object architectures get large systems to 'work together,'" which at Lotus has three meanings: coordinating programming projects, application interaction, and

OBJECT LINKING AND EMBEDDING

LINKING connects data from one program to another. Here a value in a report prepared with a word processor is linked to a cell in a spreadsheet; changes in the spreadsheet cell are reflected in the document.



EMBEDDING lets one program call upon the resources of another. Here a word processor without graphing capabilities can call on a spreadsheet program as if the spreadsheet were as integral to the word processor as, say, a spelling checker.

user-sharable programs. OO's bottom line, says Reed, "is that it delivers substantial user value."

Lotus contributed to Microsoft's OLE (Object Linking and Embedding) specification, a powerful pair of OO tools that let users relate data across programs and call in programs as extended functions to other programs. An example of linking would be changing a spreadsheet cell and having the change reflected in a document. Embedding would allow the word processing program to call up the spreadsheet program as easily and transparently as a built-in spelling checker.

Microsoft's "technical evangelist" (it says so on his business card) Viktor Grabner expects OLE to reverse the trend toward nominally single-application programs that try to cover all the bases—like word processors with modules for outlining, graphics, and font management. By allowing users to integrate their favorite programs, OLE lets them buy only what they need. And because the parts will interact better and work more consistently, multitasked applications will be enormously simplified. Grabner points out that while OOP development programs benefit users, "OLE is a true user *feature*."

To demonstrate how OLE increases functionality, Grabner offers a multimedia example: inserting voice notes under a speech icon. With a speech editor, microphone, and inexpensive voice card, users "need only invoke their file manager from within their document, do a 'File insert,' and read in their message." Double-clicking on the document's icon would read out the message. Extending the concept, any generated information—pictures, music, equations—could underlie text. Says Grabner: "OLE lets users build their own applications easily and naturally."

Getting It Together

Object-oriented languages like C++ fulfill the promise of object-oriented programs. Because graphic environments are by necessity object oriented, they work well only with applications designed for them. The process is transparent to users, but not automatic: Users must seek out programs that make it happen, understand what OOP can do and insist that it be done, and keep the heat on software companies.

Excellent OOP programs have been written without OOP languages; conversely, simply because a program was written in C++ for *Windows* doesn't ensure its quality. Data Techniques software engineer Tim Kannapel warns that there are bound to be some ringers, particularly from companies "that say their products are OO products when they're not." But companies that understand OO techniques and program in OOP languages "are dedicated to providing good code, and users can expect their programs to be more robust and overall better performers."

Today, better performance means performance that extends beyond the scope of any single program; that lets users think less about the how of their programs and more about the what of their jobs. Because managers manage resources, managers especially should demand interoperation as well as operation. Kannapel suggests that PC users considering new software give as much weight to environment as to functional features, because functions become less important "if they don't work well with other programs."

Making programs work well is what 800,000 U.S. programmers do; making them work well together is what 50 million PC users want. Thanks to OOP, "working together"—the PC user's Holy Grail—is in sight.

Alan Kaplan is a contributing editor for PC World.

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Circle 323 on reader service card

The AST Bravo 486/25 and Dell System 320LT were the most aggressively priced desktop and portable PCs in the October survey by International Data Corporation.

Best-Sellers

Leading PCs sold through traditional computer channels

1. *IBM PS/2 Model 55 SX*
2. *IBM PS/2 Model 70 (20-MHz)*
3. *Compaq LTE 386s/20*
4. *Compaq Deskpro 386/20e*
5. *NEC PowerMate SX, SX/20*
6. *IBM PS/2 Model 30-286*
7. *Compaq Deskpro 386n*
8. *IBM PS/2 Model 35 SX*
9. *Compaq Deskpro 386s*
10. *Compaq Deskpro 386s/20*

IBM's Model 55 still leads sales through the dealer channel and is joined by another SX PS/2, the Model 35, according to Storeboard/Computer Intelligence's October survey.

BARGAINS OF THE MONTH

Over the Counter

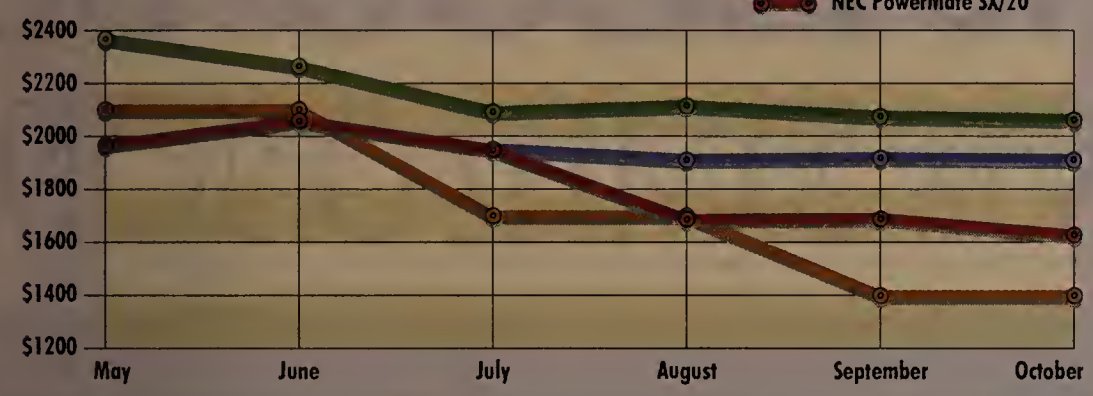
What you pay at retail stores for popular PCs

	Configuration				National				
	Speed (MHz)	RAM (MB)	Hard disk (MB)	Video adapter	List	Average	Boston	Chicago	Dallas/ Ft. Worth
80386SX-based desktop PCs									
AST Bravo 386SX/20	20	2	40	VGA	$1695	$1306	$1296	$1325	$1287
Compaq Deskpro 386s	16	2	40	VGA	$2299	$1822	$1835	$1839	$1874
Compaq Deskpro 386s/20	20	2	60	VGA	$2599	$2061	$2076	$2081	$2119
Dell System 320 SX	20	2	40	VGA	$1400	$1400	$1400	$1400	$1400
IBM PS/2 Model 35 SX-043	20	2	40	VGA	$2525	$1911	$1920	$1945	$1894
IBM PS/2 Model 55-041	16	4	40	VGA	$2745	$2042	$2009	$2001	$2059
NEC PowerMate SX/20	20	2	42	none	$2199	$1623	$1729	$1642	$1556
80386DX-based desktop PCs									
AST Premium II 386/33	33	4	210	VGA	$3795	$2899	$2801	$2964	$2897
Compaq Deskpro 386/33L	33	4	120	VGA	$6199	$4920	$4943	$4954	$4990
Dell System 333P	33	4	100	VGA	$2400	$2400	$2400	$2400	$2400
Epson Equity 386/25 Plus	25	2	100	VGA	$3199	$2410	$2339	$2451	$2303
Gateway 2000 33-MHz 386VGA	33	4	200	VGA	$2120	$2120	$2120	$2120	$2120
IBM PS/2 Model 70-A16	25	4	160	VGA	$6445	$4914	$4873	$4765	$4834
Tandy 4033 LX	33	2	105	VGA	$4398	$4398	$4398	$4398	$4398
80486SX-based desktop PCs									
ALR BusinessVEISA	20	5	120	none	$4295	$3321	$3358	$3565	$3307
AST Premium II 486SX/20	20	4	80	VGA	$3495	$2682	$2659	$2731	$2617
IBM PS/2 Model 90XP-OG5	20	4	80	XGA	$8345	$6280	$6209	$6252	$6259
80486DX-based desktop PCs									
AST Bravo 486/25	25	2	80	VGA	$3495	$2661	$2624	$2731	$2629
Compaq Deskpro 486/33L	33	4	120	VGA	$8999	$7114	$7186	$7200	$7244
IBM PS/2 Model 95 XP	33	4	320	XGA	$16,445	$12,362	$12,446	$12,387	$12,334
NEC PowerMate 486/25E	25	4	140	none	$7399	$5523	$5771	$5840	$5235
Portables/laptops									
AST Premium Exec 386SX/20	20	2	40	VGA-LCD	$3395	$2611	$2667	$2652	$2605
Compaq LTE/286	12	640K	20	CGA-LCD	$1949	$1552	$1560	$1556	$1569
Compaq LTE 386s/20	20	2	30	VGA-LCD	$4799	$3731	$3772	$3650	$3679
Dell System 320LT	20	2	40	VGA-LCD	$1999	$1999	$1999	$1999	$1999
IBM PS/2 Model L40 SX	20	2	60	VGA-LCD	$5245	$3853	$3316	$3983	$4000
NEC UltroLite 286F	12	1	20	CGA-LCD	$2199	$1651	$1647	$1711	$1556
TI TravelMate 2000	12	1	20	VGA-LCD	$2369	$1622	$1771	$1818	$1717
Toshiba T1200XE	12	1	20	CGA-LCD	$1999	$1585	$1678	$1606	$1599
Toshibo T2000SX	16	1	40	VGA-LCD	$3749	$2927	$3235	$3012	$2999

Fram an IDC survey af more than 180 camputer dealers in eight metrapalitan areas. Figures based an at least faur price quates far each machine. Prices are based an manufacturer's standard canfiguratian withaut manitar.

Trend Line: 20-MHz SX Desktops

National average street price for selected 20-MHz systems over six months



Selling for little more than their older 16-MHz brethren, 20-MHz 386SX-based systems are the entry-level business platform of choice. It's not surprising that the costs of these machines have fallen substantially in recent months. And aggressive pricing like Dell's is bound to force other vendors to cut further. A crop of cheap 25-MHz 386DX systems will also help slim down pricing on these machines.

Metropolitan

Los Angeles	Miami/ Ft. Lauderdale	New York	San Francisco Bay Area	Washington, D.C.
$1365	$1326	$1259	$1266	$1314
$1892	$1812	$1793	$1804	$1770
$2135	$2047	$2027	$2056	$2001
$1400	$1400	$1400	$1400	$1400
$1999	$1959	$1831	$1782	$1923
$2048	$2141	$1990	$1922	$2092
$1706	$1594	$1534	$1528	$1617

$2869	$2970	$2824	$2922	$2941
$5085	$4885	$4835	$5023	$4773
$2400	$2400	$2400	$2400	$2400
$2399	$2436	$2473	$2318	$2431
$2120	$2120	$2120	$2120	$2120
$5022	$5027	$4998	$4661	$5075
$4398	$4398	$4398	$4398	$4398

$3329	$3222	$3061	$3359	$3186
$2773	$2735	$2600	$2604	$2709
$6490	$6470	$6050	$5858	$6404

$2697	$2735	$2567	$2643	$2691
$7346	$7093	$7019	$7020	$6929
$12,476	$12,827	$11,923	$11,345	$12,624
$5706	$5535	$5205	$5142	$5503

$2641	$2657	$2540	$2609	$2557
$1615	$1505	$1611	$1543	$1501
$3799	$3781	$3727	$3690	$3695
$1999	$1999	$1999	$1999	$1999
$4095	$4091	$3842	$3666	$3898
$1706	$1752	$1625	$1551	$1661
$1726	$1847	$1195	$1454	$1594
$1592	$1589	$1502	$1598	$1582
$2814	$2868	$2800	$2894	$2968

PC Futures: Pricing Pressures Undimmed

AST's Bravo 486/25 is the desktop Bargain of the Month,[1] while Dell's System 320LT repeats as portable Bargain of the Month. IBM's PS/2 Model 55 SX still dominates sales through dealers. Notably, half the PS/2s on the best-seller list include a Micro Channel bus, and half include an AT bus. Many PC suppliers would rather forget 1991—flat U.S. sales accelerated dog-eat-dog price competition. Vendors that are geared for low-price production, such as AST, are prospering, while high-ticket suppliers such as Compaq and IBM are suffering. In fact, this fall when Compaq's chief executive told his board he planned to continue the company's high-priced product strategy, he was summarily fired. Costs of related hardware are also sinking. IBM recently slashed add-on memory pricing in half, for example. Notebook PCs are selling very strongly, and with high manufacturing volume, their markup over comparable desktop systems is diminishing.

Notebooks: A Shrinking Premium

*List pricing on comparable Compaq notebook and desktop with 60MB drives**

With notebooks shipping in high volumes, prices are dropping, and costs are getting closer to equivalent desktop machines'. Compaq's LTE 386s/20, which far outsells the Deskpro 386s/20, currently lists for 28 percent more. A year ago, it carried a 75 percent higher premium.

[1] Bargains of the Month are determined by adjusting prices of PCs of a given class for standard memory and storage, then finding which PC compares best.

*Includes monochrome VGA monitor for desktops.

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"King of the Hill . . . Sensational . . . The best price-performer . . . Astonishing value . . . The number one contender . . ." The praise goes on and on. Winner of PC Magazine's Editor's Choice Award *and* PC World's Best Buy Award, the experts love the ZEOS Notebook. And you'll love it too. Because as PC Magazine said, the ZEOS Notebook is simply "the hottest deal on the notebook market."

INCREDIBLE DESKTOP FEATURES IN A NOTEBOOK.

Pick your power. Choose our '386SX-16MHz version or go for the incredible new ZEOS '386SX-20MHz version. Combine that with our high speed hard disk, built in 1.44MB floppy drive, VGA and more—you've got the greatest notebook going at any price!

Look closely at the details. Like our crisp 10" VGA display. The ultimate in sparkling clarity featuring advanced fluorescent backlighting for vivid VGA graphics. And then the drives.

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For instance, the battery system of your new notebook is the most advanced on the market. You can quick charge, or trickle charge, any time your system is plugged in. Or, you can use the optional charging stand if you wish.

Either way, you're sure to appreciate our light weight snap-in, snap-out battery packs. They're so light and easy to use, you can easily take an extra one with you on those really long trips. Plus, you can get even more life out of a single charge by using our programmable power management system. Hour upon hour of Notebook computing power!

CONNECTIVITY TOO!

Your new ZEOS notebook is a great connectivity tool! Using our optional built-in 2400 baud MNP® Class 5 modem, connectivity buffs will find themselves logging on at every turn.

And speaking of connectivity, we've kept the I/O easy to use too. Because unlike many of the others, your new ZEOS notebook has the same industry standard port connectors you'll find on your larger desktop system. Serial and Parallel ports; even an external VGA connector. Completely compatible!

ZEOS 24 HOUR A DAY SUPPORT.

Don't forget your new ZEOS notebook is backed by the best Technical and Sales support in the industry, 24 Hours a Day. We're always here to help, *any time* of the day or night. And we don't stop there either.

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ONLY $1795!

20MHz ONLY $1995!

- '386SX-16 or '386SX-20.
- 1MB DRAM, expandable to 3 or 5MB.
- 20MB High Speed HDD.
- Built in High Density 3.5" 1.44MB floppy drive.
- High resolution VGA display. Fluorescent backlit 640x480, 32 grey scales. Bright and clear!
- Removable quick charge NiCad battery. Two hour plus battery life typical, more using Programmable Power Management!
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- Extra battery packs and external charging stand available.
- 82 key keyboard. True 101 key emulation.
- Industry standard Serial and Parallel Ports.
- VGA port for external VGA color display. Great for demos!
- Total system weight 7 lbs. with battery.
- 30 Day Absolute Satisfaction Money Back Guarantee and ZEOS Customer Satisfaction Package.
- One Full Year Limited Warranty.
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Small size plus big performance equals a successful formula for notebook PCs.

Christine Whyte

The reliability, processing speed, and compact size of 386-based notebook PCs have won customers' hearts. Users are also pleased with their computer's weight and warranty; a majority would buy another computer from the same vendor. These insights and more were gained from *PC World*'s random phone survey of 318 people who own notebooks made by seven major companies.

In our September 1991 issue we looked at respondents' satisfaction with 286- and 386-based models. With the quality and number of these notebook PCs increasing rapidly, we decided to take a second, more comprehensive look at the current crop of 386-based models.

We asked owners to rate their satisfaction in 14 areas such as keyboard functionality and technical support. As a group, our survey respondents were satisfied in all these areas, to varying degrees. The five factors mentioned above —reliability, processing speed, size, weight, and warranty—received the highest ratings; screen readability, battery life, and pricing ranked lowest.

When we asked our respondents about overall satisfaction with their computer, each vendor's customers chose close to a 4, or "satisfied," rating on a 5-point scale. The Zeos and AST ratings were the highest.

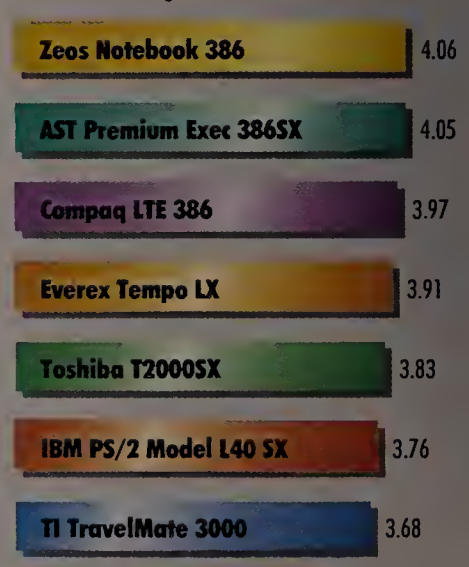
Eighty-six percent or more of the Compaq, AST, Everex, and Zeos customers would buy another notebook PC from the same vendor. The other companies also fared well with this indication of customer satisfaction: Between 74 and 78 percent of the Texas Instruments, Toshiba, and IBM customers would also loyally return to their current vendor for another notebook purchase.

The respondents also reported reasons for wanting to buy—or not to buy —another notebook PC from the same vendor. Among the 84 percent who would buy from the vendor again, the reasons cited most often were product reliability, overall company service, and computer size and processing speed. Price was at the bottom of the list. The 13 percent who would turn to another company for their next notebook purchase were most critical of their current vendor's service and technical support and the computer's reliability and price.

Christine Whyte is a freelance editor in San Francisco.

ZEOS AND AST RANK HIGHEST

Overall satisfaction with product
1=low 5=high



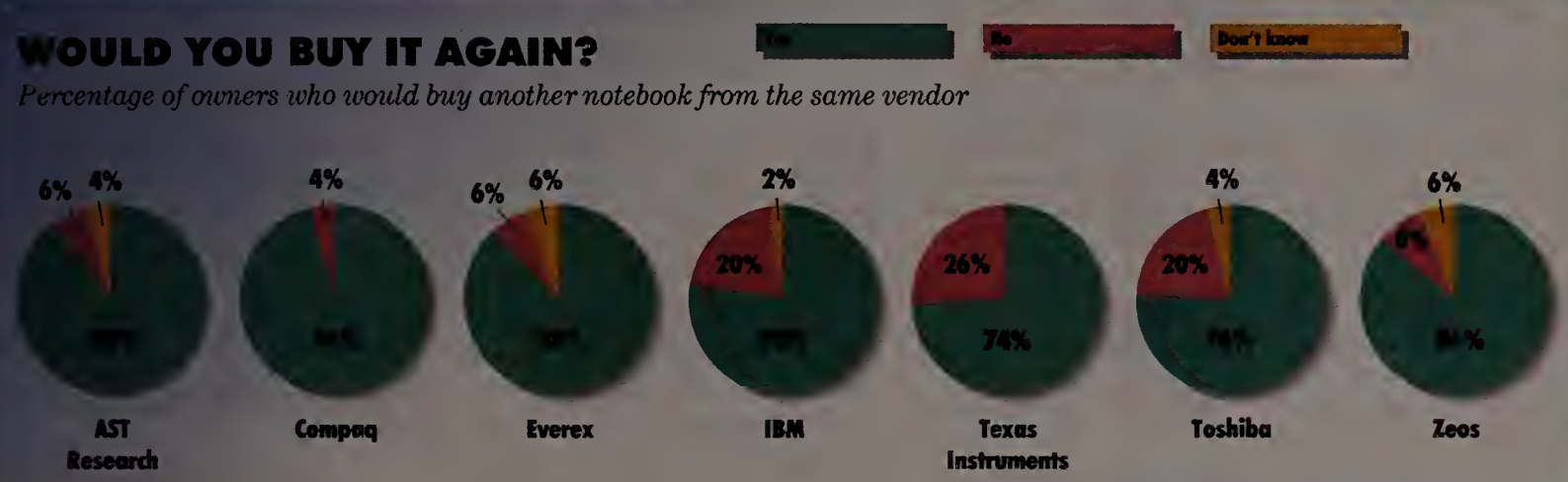
RELIABILITY, PROCESSING SPEED EARN HIGH OVERALL RATINGS

Satisfaction with key features
(Values: 5 – high)

	Overall	AST Premium Exec 386SX	Compaq LTE 386	Everex Tempo LX	IBM PS/2 Model L40 SX	TI TravelMate 3000	Toshiba T2000SX	Zeos Notebook 386
Reliability	4.22	4.27	4.53	4.12	4.25	3.93	4.28	4.15
Processing speed	4.15	4.36	4.54	4.03	3.98	3.77	4.18	4.22
Computer size	4.08	4.24	4.26	4.06	3.74	4.31	3.84	4.14
Computer weight	3.91	4.12	4.04	3.79	3.70	4.34	3.64	3.76
Breadth of warranty	3.86	3.95	3.90	4.00	3.83	3.50	3.76	4.07
Keyboard functionality	3.85	4.02	3.60	3.88	4.02	3.86	3.88	3.70
Screen size	3.84	3.80	3.74	3.97	3.80	4.06	3.66	3.88
Service	3.84	4.00	3.95	3.86	4.05	3.55	3.69	3.80
Length of warranty	3.83	3.94	3.73	4.03	3.80	3.48	3.75	4.09
Technical support	3.82	3.89	3.69	4.00	3.93	3.46	3.58	4.16
Battery recharging cycle	3.76	3.70	4.06	3.94	3.46	3.45	3.85	3.88
Screen readability	3.71	4.04	3.80	3.82	3.38	3.89	3.52	3.50
Battery life	3.64	3.70	4.06	3.52	3.36	3.33	3.79	3.73
Price	3.56	3.86	3.18	4.00	2.94	3.35	3.38	4.19

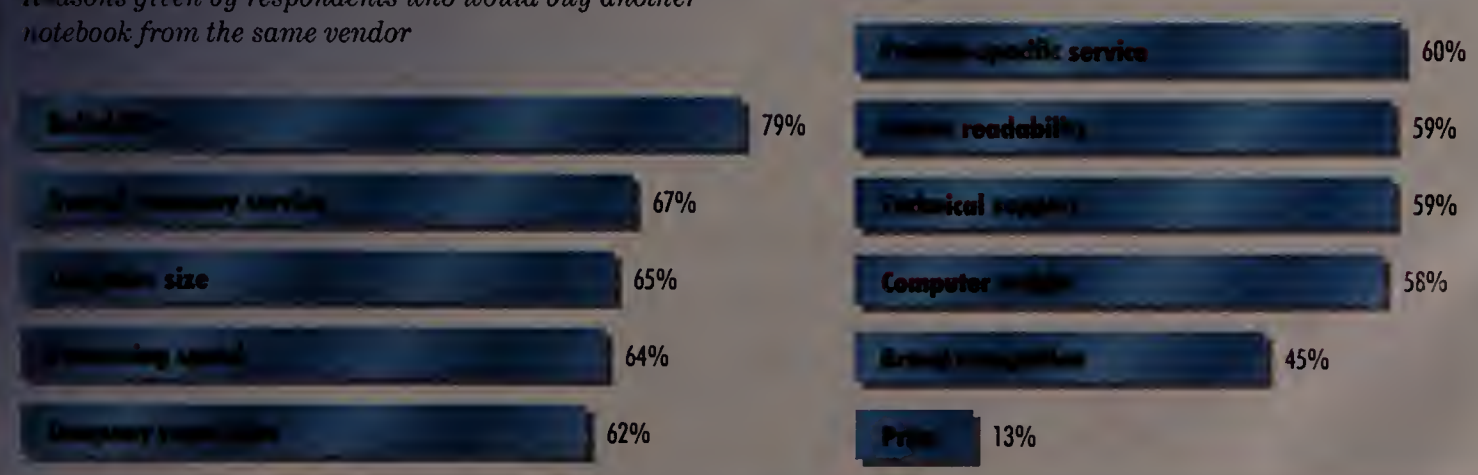
WOULD YOU BUY IT AGAIN?

Percentage of owners who would buy another notebook from the same vendor



REASONS TO BUY AGAIN

Reasons given by respondents who would buy another notebook from the same vendor



Source: Data is based on on October 1991 random phone survey of 318 owners of one of the following seven notebooks: AST Premium Exec 386SX (50 owners); Compaq LTE 386 (50); Everex Tempo LX (33); IBM PS/2 Model L40 SX (50); TI TravelMate 3000 (35); Toshiba T2000SX (50); Zeos Notebook 386 (50). This data represents the opinions of the survey respondents. Percentages were rounded.

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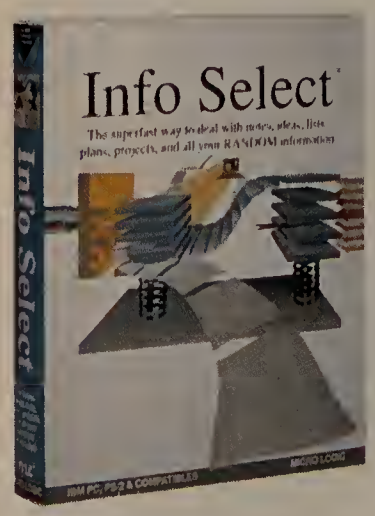

and much more. INFO SELECT™ will not only give you instant access to this important information ... it will help you make better decisions and see important new relationships. Try INFO SELECT risk-free and discover a whole new dimension of computing.

Photographic memory

INFO SELECT is like having a 'photographic memory' that gives you perfect superfast recall of up to 64,000 items of information.

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When Harry calls you on the phone, you'll display the six windows on Harry before he finishes his first sentence! No more embarrassing pauses or scrambling for information.

INFO SELECT is easy to use - yet powerful.

INFO SELECT also includes the world's first "3-D" word processor. You'll be amazed at how it works.

Instead of one window or ten, imagine up to 64,000! The uses are endless.

Are you forgetful?

Were you born with a memory situated squarely on the tip of your tongue? Do you forget things like which day you placed an order or important numbers? If you are forgetful you especially need INFO SELECT - the software that remembers almost everything for you.

Thinking tool

Have you ever worked on a complex project and felt lost? With INFO SELECT you'll group, scan, and cross search through all your notes so fast you'll see the big picture in seconds.

Will I be better off doing this now or that later? Keeping priorities straight can make or break your career or your business. INFO SELECT lets you keep on top of what's hot.

Should you use an east or west coast supplier? To make decisions you need facts. Now you can view the facts any way you like ... as fast as you can think. You'll make the best decisions ever -- and fewer expensive mistakes.

Phone notes

Client info

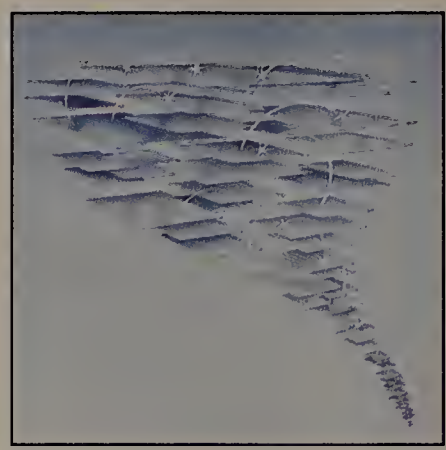
Decisions

Management

The #1 PIM

What's all the fuss about PIMs (Personal Information Managers)? Simple - you probably have more RANDOM information than any other type and you need a PIM to properly handle this kind of information. The right PIM will save you time and make everything you do go smoothly.

Why is Info Select the #1 PIM? Because Info Select is based on ideas you can identify with - like stacks of paper. And it's free-form too. You won't waste days or weeks learning complex structures. Instead you'll be up and running in minutes. Info Select also does more and costs less than other PIMs.



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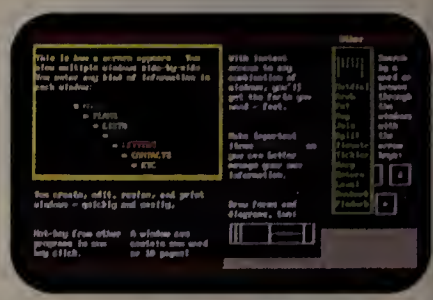

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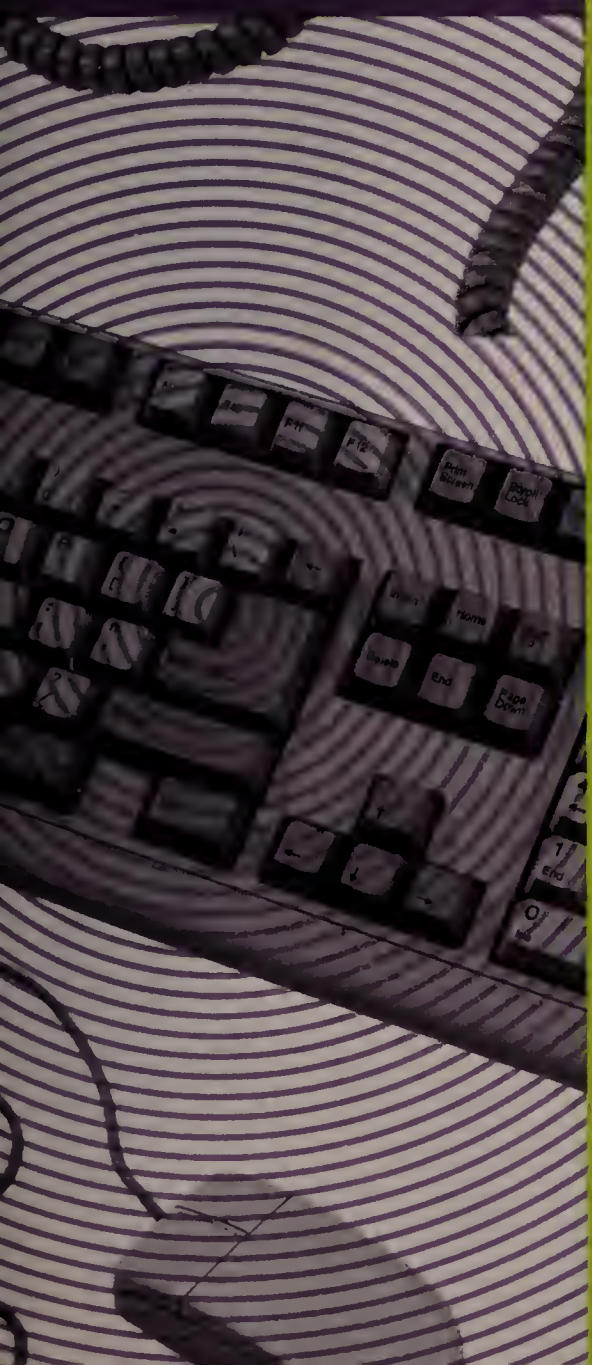

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You'll want to get in on this new technology soon, if you haven't started already. Let our editors tell you who's making what, how it works, how much it costs, and where to buy it. Their first person accounts of the magical journey into multimedia will capture your imagination and get you started on your own adventure. Whether you (or your kids) are seeking entertainment or lifetime education, you'll find the full story in MPC.

Desktop Publishing

Our road testers are seasoned desktop publishers with strong opinions about page layout powerhouses Ventura Publisher and PageMaker.

Alice LaPlante

PageMaker's forte is color design, while *Ventura Publisher* is more proficient at black-and-white business documents. But with each release, these programs grow more alike: *PageMaker 4.0* added long document features, and *Ventura Publisher Windows Edition 4.0,* due to ship at the end of 1991, will add professional color capabilities. Nevertheless, this month's road testers—two *Ventura* experts who use both the *GEM 3.0* and *Windows 3.0* versions and two *PageMaker 4.0* veterans—wouldn't dream of switching from their respective programs. Read on to learn why these desktop publishing gurus are so loyal.

PAGEMAKER

Sheila Brown *has used* PageMaker *for more than two years to typeset books, newsletters, and magazines for a small independent publishing house.*

PageMaker is so flexible, I've never wanted to switch. We do a lot of ad production, and *PageMaker* makes it easy to grab a text block and place it anywhere on the page or move a line a little to the right or left. Doing the same thing in *Ventura* is too complicated.

I also like the style palette's flexibility. For example, you can change the leading on two or three lines of text without affecting other text that has the same style tag.

I wish *PageMaker* allowed me to tie text to other elements on a page. When we put a text block or a caption in a box and then move that text, the box won't move with it.

PageMaker was pretty easy to learn. I took a three-day class, then worked closely with another person who could answer my questions. And the manual is so clear that I've only had to call Aldus once or twice for help.

Christine Leatz *uses* PageMaker *to produce a newsletter, brochures, and technical documentation that are distributed throughout her company.*

PageMaker is our de facto standard, on both the PC and the Mac. Switching back and forth between versions is easy, because Aldus has kept the user interface on each version virtually identical, and exchanging files is no problem.

The latest version of *PageMaker* handles longer documents better because of its indexing feature, and with its built-in story editor, you can edit articles in *PageMaker* without going back to your word processor. This version also manages color better—especially spot color.

The *PageMaker* menus are intuitive and consistent across features, so it's easy for a new user to catch on. Aldus's support is the best of any software vendor I've worked with: You know you won't get stuck on hold for a long time, and the support people know what they are talking about. But because the documentation is so good, we usually don't have to call at all.

VENTURA PUBLISHER

Dennis Lucey *has been using the* GEM *version of* Ventura Publisher *for four years to produce software manuals, but his company will soon be switching to the* Windows *version.*

JERRY SCHRAEDER — MICHAEL ABRAMSON — ANN STATES — DAN DOYLE

DENNIS LUCEY
Position: Technical writer
Company: Dun & Bradstreet Software, Framingham, Massachusetts
Hardware: 20-MHz 386, 6MB RAM, 120MB hard drive

CHRISTINE LEATZ
Position: Office technology manager
Company: FMC Corporation, Chicago
Hardware: 20-MHz 386, 4MB RAM, 40MB hard drive

SHEILA BROWN
Position: Desktop publishing operator
Company: Publishing Concepts, Atlanta
Hardware: 25-MHz 386, 4MB RAM, 120MB hard drive

ELIZABETH WOOD
Position: President
Company: Egeland, Wood & Zuber, Scotia, New York
Hardware: Various systems; 386 and 486 PCs, 2MB to 16MB RAM, 40MB to 320MB hard drives

Ventura comes close to *PageMaker* as a good newsletter tool, but for multichapter publications I can't see why anyone should use anything except *Ventura*. The program's cross-referencing feature is wonderful: It automatically changes all references every time you move a section of your document.

However, *Ventura* does have some room for improvement. It would be nice to eliminate the need for a separate word processing package, and the *Word for Windows* file conversion is a little awkward right now. *[Editor's note:* Ventura Publisher Windows Edition 4.0 *will accept* Word for Windows *files directly.]*

Ventura's GEM version has a definite speed advantage over the *Windows* version. When we migrate files between the two versions, about 99 percent of the time they go through without a hitch.

When you call Ventura Software for technical support you sometimes have to wait a long time before you get through. This program is not one you can learn overnight: Still, no other PC package compares to *Ventura* in terms of power and flexibility.

Elizabeth Wood *runs an advertising and design agency that also provides desktop publishing training and consulting.*

Early on, we chose the PC instead of the Mac because *Ventura* has more sophisticated typography than *PageMaker* does. We now use *PageMaker* to design some items but use *Ventura* to produce them—from simple one-page data sheets to complex advertisements.

Ventura has many add-on programs, such as Ventura Software's *Ventura Database Publisher*, which help us enormously. And the new 24-bit color capabilities announced for *Ventura* will put it way in front of *PageMaker*.

Alice LaPlante is a freelance writer in Palo Alto, California.

REPORT CARD

	PageMaker 4.0		Ventura Publisher 3.0	
	Sheila Brown	Christine Leatz	Dennis Lucey	Elizabeth Wood
Ease of use	B+	A	B	A
Page design and layout	A	A	A	A
Text handling	A	A	A	A
Graphics handling	B	A	A	B
Support and service	B+	A+	B	*
Overall	A-	A	A-	A-

*User did not use feature.

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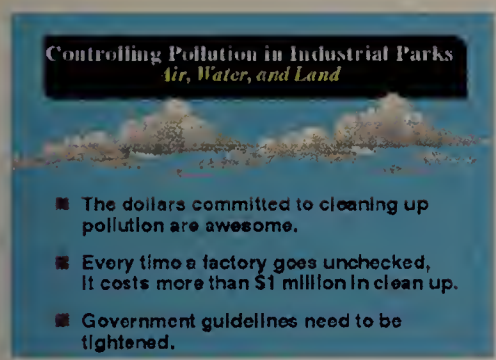

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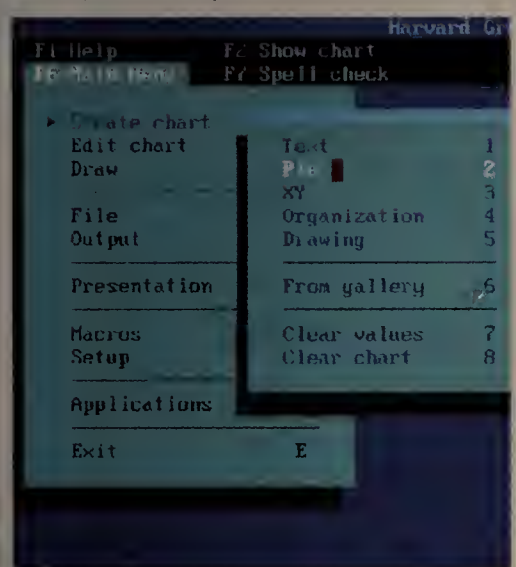

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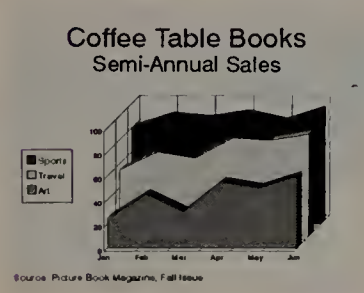

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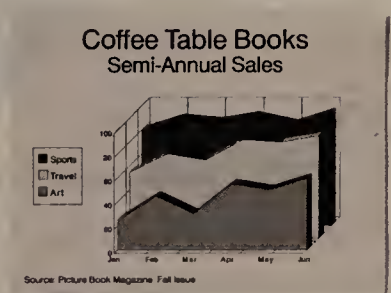

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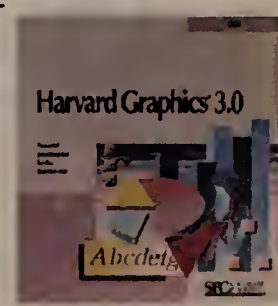

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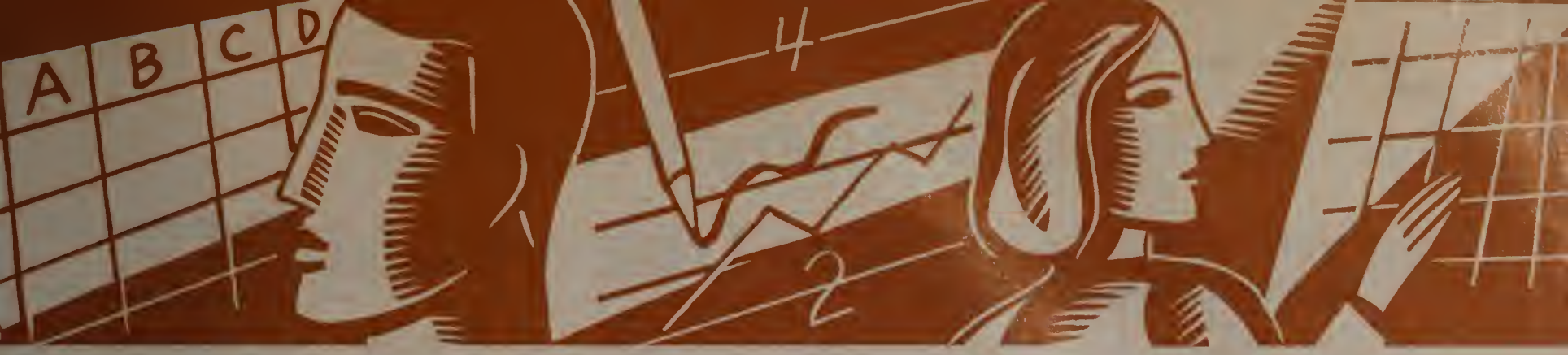


SPREADSHEETS (A..Z)

Practical tips for building better worksheets

Richard Scoville

At first, everything looked okay. I mean, all you did was add a few numbers in your *1-2-3* worksheet with @SUM(), right? But suddenly you notice your sum has changed all by itself: It seems to be larger than it was a moment ago. *Then* you notice that every time you enter something into another cell, the renegade sum gets bigger! Finally, you realize that pressing <F9>, the key that recalculates your worksheet formulas, causes the sum to increase. What's going on here?

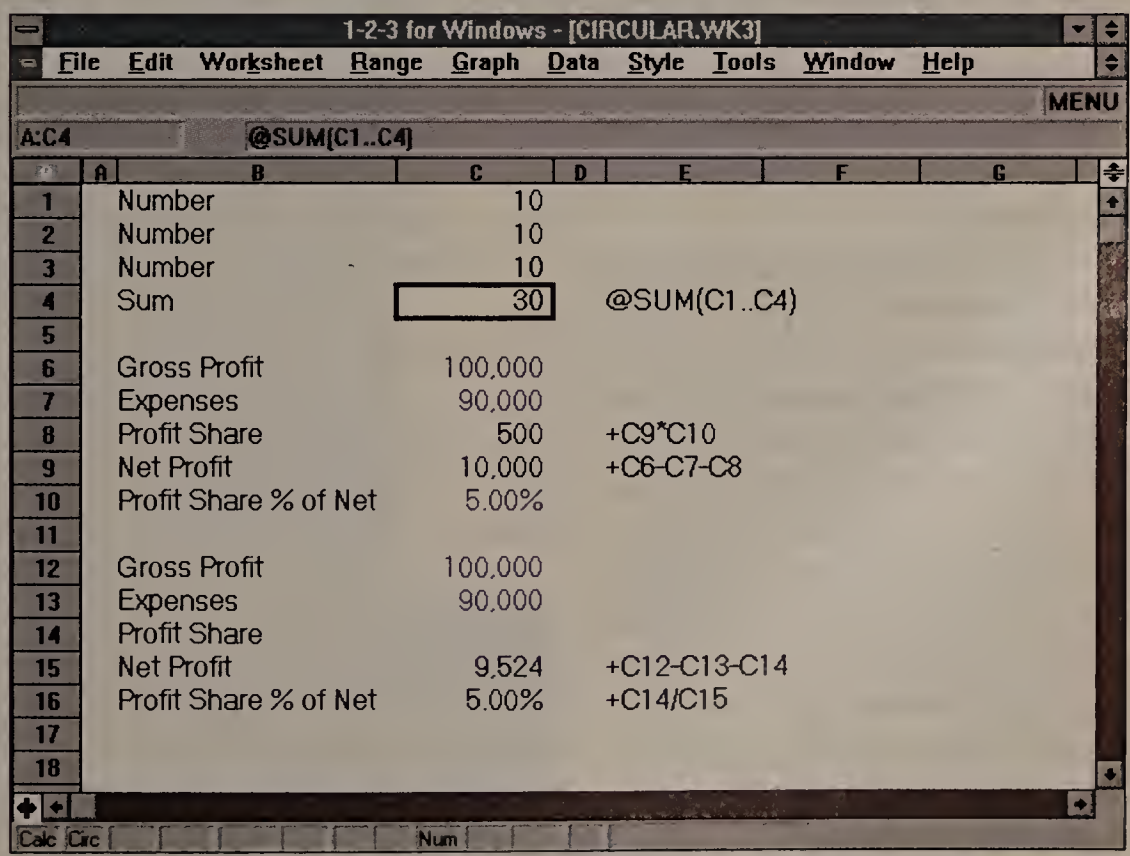
The answer is, by mistake you built a formula containing a circular reference. In this month's column, we'll explore these strange creatures, see where they come from, find out how to get rid of them, and learn how to put them to work. The examples shown here in **SCREEN 1** were done in *1-2-3/W*, but you'll find it's possible to complete the calculations with any popular spreadsheet program.

Circular Errors

The first example shown in **SCREEN 1** illustrates the most common error involving circular formula references. To follow along in *1-2-3* or *Quattro Pro*, set the global numeric format to display zero decimals, then enter the values shown in C1..C3. Put the cell pointer on C4, type **@SUM(**, move the cell pointer to C1, press **<Period>**, paint the range C1..C4, and press **<Enter>**. You'll see the presumably correct answer appear in C4. Notice that you've included the cell that contains the formula inside the range summed by that formula. In *1-2-3*, when you press **<F9>** to recalculate, the sum increases to 60: It's added its own current value to the result.

Quattro Pro, *1-2-3*, and *Excel* let you know when you've created a circular formula. *1-2-3* and *Quattro* display a 'CIRC' flag in the status line at the bottom of the screen. If you don't know which formula is causing the circular reference, the program tells you where to look: In *1-2-3* release 2.*x* or 3.*x*, select */Worksheet Status;* in *Quattro*, select *Options Recalculation* and look for 'Circular Cell'. In *1-2-3/W* select *Help About 123*. Fixing the problem is simple. Just put the cell pointer on the formula, press **<F2>** to edit it, change 'C4' to **C3**, and press **<Enter>**.

Excel will normally screen out these routine circular reference errors. If you try to build the analogous formula with *Excel*—that is, =SUM(C1..C4)—you will receive an error message that reads, 'Cannot Resolve Circular Reference'; then when you click OK, a zero will appear as the answer. If you want *Excel* to perform circular calculations, you first have to enable them: Select *Options Calculation*, choose *Iteration*, and click *OK*. The sum in C4 quickly rolls up to 3000 as the formula recalculates 100 times.



SCREEN 1: Circular formulas use their own output as input. They can be the result of errors, like the self-magnifying sum in C4 that includes its own cell inside its range. They can also can be used intentionally: In C8..C9, a circular formula calculates profit share as a percentage of net profit, where net profit is figured after the profit share is subtracted.

ANTHONY RUSSO

Spreadsheet Toolbox

Teach Your Spreadsheet to Think for Itself

Normally you use your spreadsheet formulas to calculate results based on known values. If, as with budget calculations, you know what result you want, you can find data values to produce those results with the aid of the Solvers supplied with *1-2-3* release 3.1+, *1-2-3/W*, *Excel*, or *Quattro Pro*. But what do you do when you don't know which formulas to use? You might try *Braincel*, a pioneering artificial intelligence add-in for *Excel* from Promised Land Technologies.

For instance, you're asked to rate the credit worthiness of loan applicants. Such ratings are traditionally the result of intuitive judgments based on the customer's income, expenses, years on the job, number of dependents, and so on. No formulas can quantify such judgments. You create an *Excel* worksheet loaded with data from a number of past clients, along with a rating assigned by an expert loan officer. Define a few range names telling it where the data and results are, then "train" *Braincel* for a few minutes to several hours. At the end of the training period, *Braincel* can make respectable judgments about new clients consistent with the ones the human expert would have made.

Based on cutting-edge research in neural networks, *Braincel* is a fascinating, almost eerily powerful program that deserves a look by any manager saddled with too many decisions to make (or, for that matter, eager to place the winning bet on the Superbowl). Who knows, maybe you too can delegate your brain to *Braincel*.

Braincel $249.00; Promised Land Technologies, Inc., 900 Chapel St. #300, New Haven, CT 06510; 800/243-7335

Reader service no. 601

Circular Logic

Given these bizarre results, why don't spreadsheets simply refuse to accept circular formulas? The answer is, of course, that the solutions to some problems require circular calculations. For instance, suppose your small company sets aside 5 percent of net profit for its profit-sharing plan, where the amount earmarked for bonuses is subtracted *before* the net profit is calculated. Look once again at **SCREEN 1**. Enter the labels shown in B6..B10 and the values in C6, C7, and C10. Then, in C9, enter the formula to calculate the net profit: **+C6, C7,** and **C8**. In C8, enter the formula to calculate the profit share: **+C9*C10.** The circular reference ensures that the calculation of net profit is a function of profit share, while the profit share depends on the net profit.

In *1-2-3* and in *Quattro*, the formulas initially assume the values shown in the figure. In order to get the true answer, press **<F9>** until the values stabilize at $476 and $9524. In *Excel*, the formulas immediately recalculate until the values change by less than .001, provided of course that you have first enabled circular calculations.

Circular Solutions

If you use *1-2-3/W*, *1-2-3* release 3.1+, *Quattro Pro*, or *Excel*, your spreadsheet provides a feature specifically for problems like this without resorting to circular formulas. The trick is to change the problem's logic slightly, then use the Backsolver to vary the profit share until it reaches 5 percent.

First enter the labels shown in B12..B16 and the values shown in C12 and C13. In C15 enter **+C12-C13-C14**, the formula for the net profit. In C16 enter a formula that calculates the profit share percentage for a given profit share amount: **+C14/C15**. In *1-2-3/W*, select *Tools Backsolver* in the dialog box, specify **C16** as the Make cell, **.05** as the Equal to value, and **C14** as the By changing cell. Then click on *Solve*.

In *Quattro*, select *Tools Solve for*. Next specify **C16** as the Formula Cell, **.05** as the Target Value, and **B9** as the Variable Cell. Select *Parameters* and specify **.001** as the Accuracy. Then select *Go*. In *Excel*, start by entering an initial guess, say 500, into C14. Then select *Formula Goal seek;* in the dialog box, specify **C16** as the Set cell, **.05** as the To value, and **C14** as the By changing cell, and then click *OK*.

A moment's reflection reveals that circular formulas such as these actually represent a set of simultaneous equations with two unknowns, namely Profit Share and Net Profit:

1. SHARE+PROFIT=10000
2. SHARE/PROFIT=.05

The problem is simple enough for Backsolver, but it could also be handled easily with the Solver in *1-2-3/W*, *1-2-3* release 3.1+, or *Excel*, and a little less easily with Quattro's Optimization Command, which is more difficult to use.

So when you find yourself thinking in circles, take a few minutes to analyze the problem, and you may soon be running circles around the competition!

Questionable Spreadsheets Department

Q. *When I assumed my current position, I inherited a* 1-2-3 *macro from my predecessor that sorts and prints a table of maintenance records. Because the table changes its size each time that I run the macro, it includes two statements to redefine a range name (TABLE) that covers the data to be sorted and printed:*

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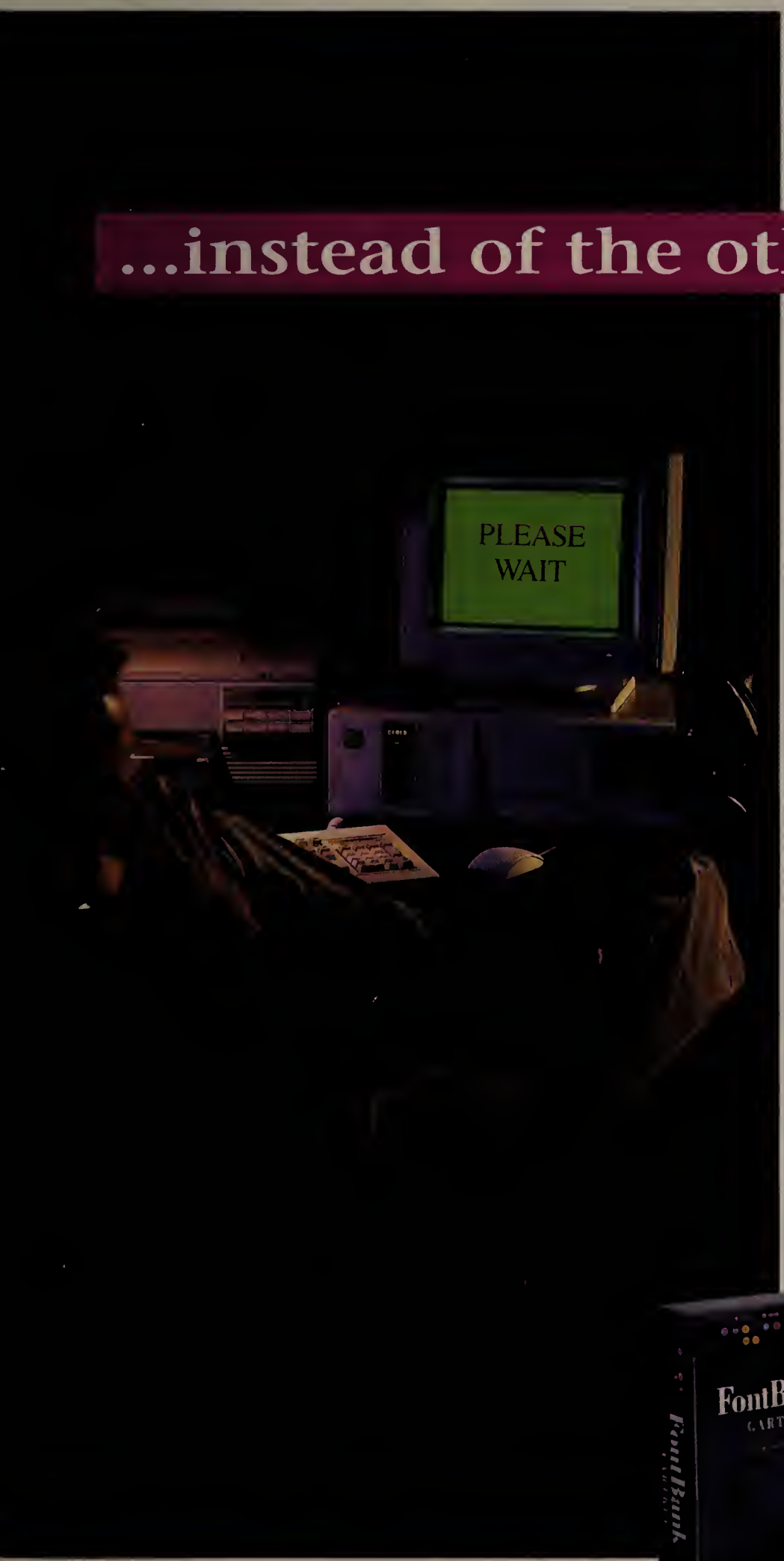

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	A	B	C	D	E
1	W	X	Y	Z	
2	A	123	234	345	
3	B	234	345	456	
4	C	345	456		
5	D	876	765	654	
6	E	543		321	
7					
8	\R	{goto}TABLE~			
9		/rndTABLE~/rncTABLE~{u}{end}{r}.{end}{d}~			
10					
11	\S	/rncTABLE~{esc}.{u}{end}{r}.{end}{d}~			
12					
13	\T	{goto}HEADINGS~{d}			
14		/rncTABLE~{bs}.{u}{end}{r}.{end}{d}~			

FIGURE 1: Here are three approaches to writing 1-2-3 macros that redefine a variable-sized named range. To build it, start by entering all labels and values. Next, use /Range Name Create to define the range names TABLE and HEADING to A1..D1 and A2..D6, respectively. Then select /Range Name Labels Right to name the macros, and specify A8..A13.

{goto}TABLE~
/rndTABLE~/rncTABLE~{end}{d}{end}{r}~

Why does the macro delete the range name and then re-create it? What's the best way to do this job?

Edgar Chen
Plano, Texas

A. Redefining a range name is one of the most basic tasks that macros must perform. The proper technique for accomplishing it depends on the condition of the range when you redefine it.

FIGURE 1 shows a variation of your macro, along with two alternatives. The range name TABLE covers A2..D6; a second range name, HEADINGS, covers A1..D1. Notice that cells D4 and C6 are empty.

The first macro, \R, is similar to the one you submitted. It prevents the error that can arise in *1-2-3* release 2.*x* and *Quattro* when two names refer to the same range; in that case, redefining one range automatically redefines the other. The only way to unlink them is to delete one of the range names and re-create it. (This technique is unnecessary in *1-2-3* release 3.*x*, which does not link ranges in this way.)

B8: (\R): {goto}TABLE~ positions the cell pointer on TABLE. That statement assumes TABLE is intact when the macro runs. (A range typically becomes undefined when you delete one of its edge rows or columns.)

B9: /rndTABLE~/rncTABLE~{esc}.{u}{end}{r}.{end}{d}~ deletes the range name TABLE to unlink it from another range name if necessary. Then it re-creates the range name beginning on the current cell.

{Esc}. reanchors the cell pointer on the current cell. This ensures that the following pointing technique will work correctly.

The {u}{end}{r} statement highlights the range along the labels on row 1; .{end}{d}~ switches the movable corner of the range to the upper left and moves it down the labels in column A. Unlike Chen's macro, this technique works properly even when TABLE includes blank cells like D4 and C6.

Use the next macro when you're sure that TABLE is intact and, in release 2.*x*, when there's no chance of a linked name:

B11: (\S): /rncTABLE~{esc}.{u}{end}{r}.{end}{d}~ {Esc} shrinks the range back to its original upper-left corner cell, so you need not go to the range before you redefine it.

The final variation is appropriate if TABLE may have been damaged since the last time you ran the macro:

B13: (\T): {goto}HEADINGS~{d} If TABLE is undefined, {goto} isn't able to move there. This statement moves the cell pointer to where TABLE is supposed to begin by going to an adjacent range (HEADINGS) and then moving into position.

B14: /rncTABLE~{bs}.{u}{end}{r}.{end}{d}~ When TABLE is not damaged, {bs} shrinks the cell pointer to the cell where the command began; when it is damaged, {bs} does nothing.

Just select the proper technique to make your print, sort, and other macros work reliably every time.

Send your spreadsheet questions to Richard Scoville, CompuServe 72341, 2727; MCI Mail 357-4517; 415/442-1891 (fax); or mail them to Spreadsheets (A..Z), PC World, *501 Second St. #600, San Francisco, CA 94107.* PC World *pays $50 for published questions. Sorry, we cannot acknowledge submitted materials.*

Richard Scoville is a contributing editor for PC World.

POWER TIP NO. 234

Print Corel Draw 2.0's Keyboard Templates and Tricks

If you installed Corel Draw 2.0's sample files, you'll find that TEMPLATE.CDR contains keyboard templates for standard and extended keyboards, plus a table showing the keyboard shortcuts. Use the Open command to load the file from the \SAMPLES subdirectory, then print it.

Mary Ginder
Baltimore, Maryland

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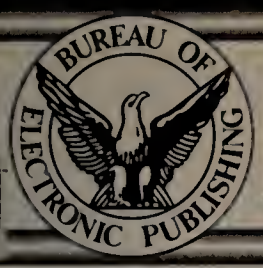

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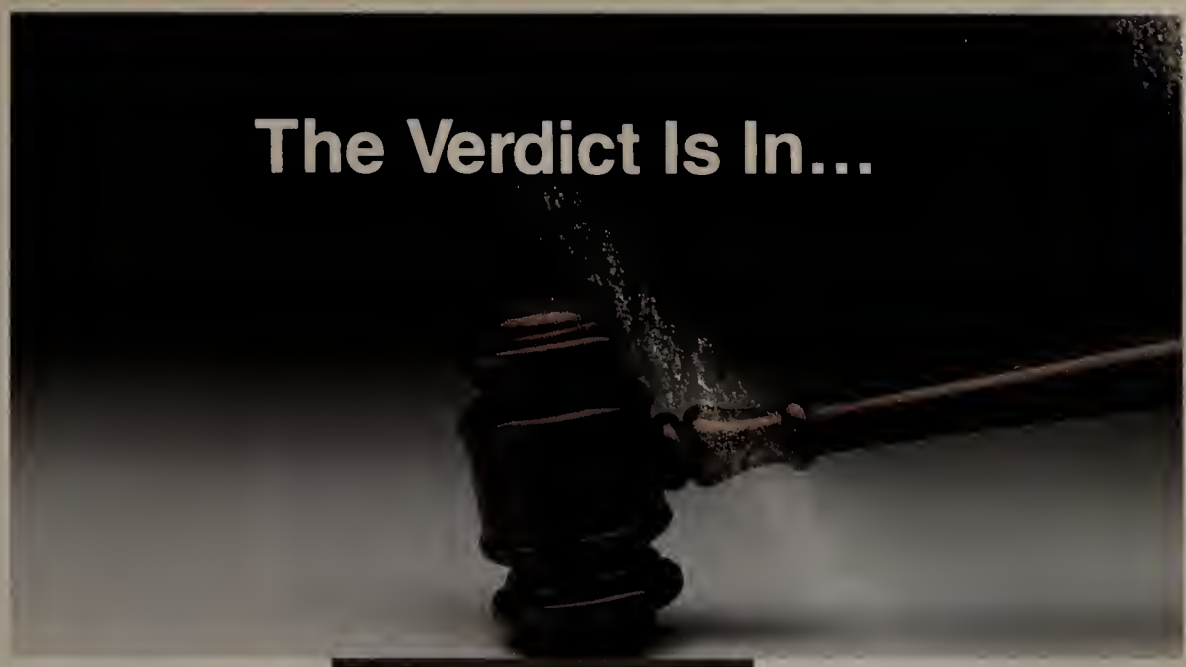

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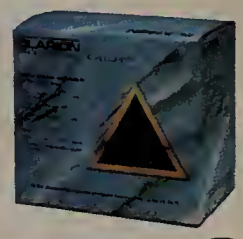

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WORD PROCESSING CLINIC

Tips for getting the most out of your word processor

George Campbell

Q. *The company I work for uses WordPerfect 5.1,* but I use *Word 5.0* at home. I'm used to *Word*'s <Alt>-*key* shortcuts, such as <Alt>-B for boldface. Is there a way to add these keystrokes to *WordPerfect?*

Linda Masterson
Sacramento, California

A. It takes a little doing, but you can alter *WordPerfect*'s keyboard almost any way you like.

To start, press **<Shift>-<F1>K** to bring up the keyboard selection screen. You'll see a list of alternate keyboards if any are installed. Appendix H in the *WordPerfect 5.1* manual explains each of them. To create your own keyboard, press **C**, then type a name for your personal keyboard and press **<Enter>**. Press **M** to see a keyboard map.

Move the cursor to the keystroke you want to change. Next, if you're creating a shortcut for a *WordPerfect* function key command, press **K**, then press the desired command's key. For example, to assign boldface to <Alt>-B, move the cursor to B in the <Alt> section of the keyboard map, then press **K<F6>**.

To map something more than a basic *WordPerfect* command, create a keyboard macro. To do this, move the cursor to the desired key, and press **M**. You'll see a macro editing screen. Press **<Delete>** to clear the contents of the screen, then type the *WordPerfect* keystrokes that make up the macro. To assign italics to <Alt>-I, for example, locate the cursor on the I on the Alt map, and then press **M<Delete><Ctrl>-<F8>AI<F7>**.

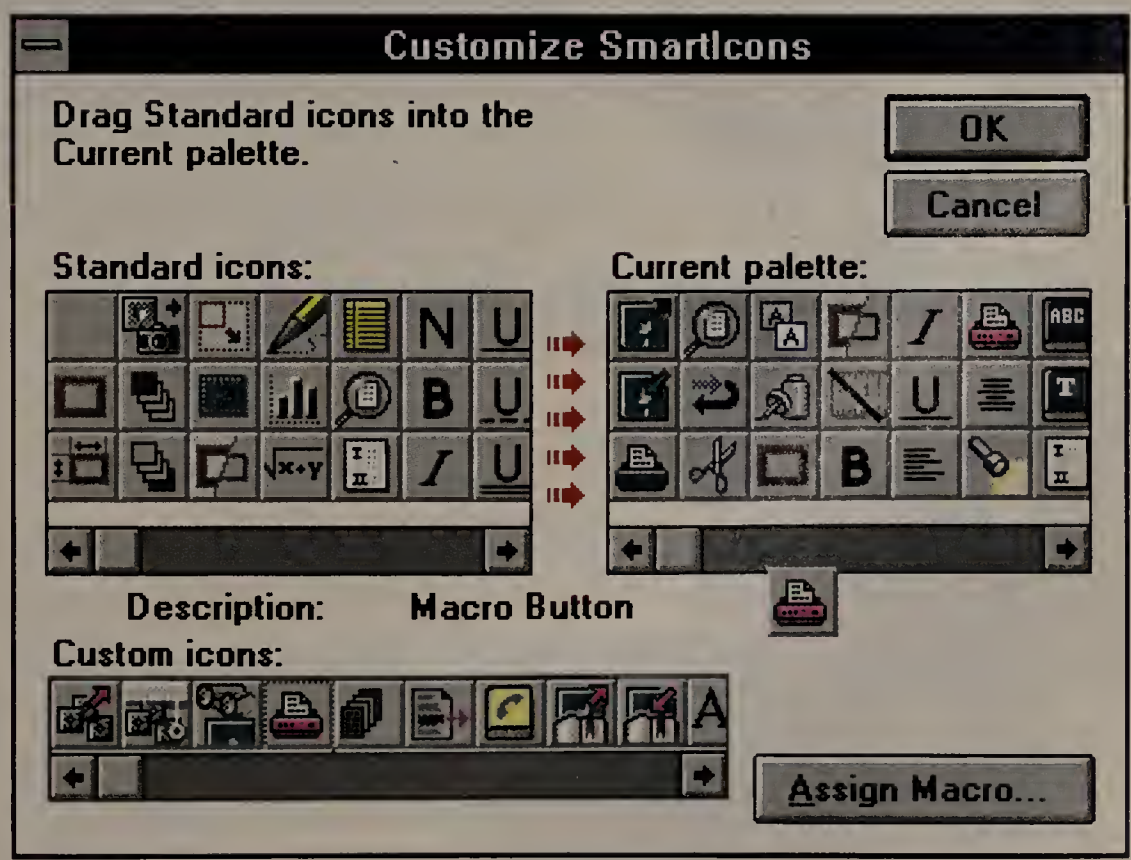
When you're finished, press **<F7>** twice to make this keyboard layout the default. To make changes later, simply repeat the process.

Q. I just installed *Word for Windows* but am still using *Word 5.0* as well. I'd like to use the same keys for selecting text in *Windows* that I use in the DOS version. Is that possible?

Katherine Bagwell
Duluth, Minnesota

A. There's an easy way to assign the old, familiar text selection keys in *WinWord.* For a single document, start *Word for Windows* and select *File New.* Scroll through the template selection box to the PCWORD entry and select *OK.* From then on, while editing the document, most *Word 5.0* function keys work in the same way as they did, including text selection commands.

To avoid selecting the PCWORD template file each time you want to use those old keystrokes, you can make it the default. To do this, exit *WinWord* and either select the DOS prompt icon or exit *Windows.* Change to your *WinWord* directory with the CD command. Before going any further, however, make a backup copy of *WinWord*'s NORMAL.DOT template. Type **COPY NORMAL.DOT *.BAQ**, then press **<Enter>**. Now, give the command **COPY PCWORD.DOT NORMAL.** and press **<Enter>**. From that point on, when



Ami Pro 2.0 lets you assign any macro to a SmartIcon for instant access from your SmartIcon display. This dialog box lets you customize the display with a few simple steps.

ANTHONY ROSSO

you start *WinWord*, it will automatically load the template containing your old *Word* for DOS function key commands.

Q. *I often create multicolumn documents in* WordPerfect 5.1, *but it's difficult to move the cursor to the top of a particular column. Is there a shortcut?*
Kare Grams
Costa Mesa, California

A. That's a good question. *WordPerfect's* <Ctrl>-<Home> *cursor key* combinations take too many keystrokes. There are two easy solutions. If you have a mouse, move the mouse cursor to a new location and click the left button. Or, you can use the <F2> command (Search) to move from column to column.

To use the search method, first mark your columns. When you start a new column, type a distinctive character at the top of each column. For example, use one asterisk at the top of column one, two for column two, and so on.

Once the marks are in place, you can search for them. Say you're in column one but want to move to the top of column three. Just press **<F2>**, type three asterisks, then press **<F2>** again. To move backward in the document, substitute **<Shift>-<F2>** for the first **<F2>**.

The same method can mark locations anywhere in a document, making it easy to jump around. When it's time to print, you'll want to remove the marks. Press **<Home><Home><Up><Alt>-<F2>N**, type the character you've used for marking, press **<Alt>-<F2>** twice, and all marks will disappear.

Q. *I've created a macro for envelope printing in* Ami Pro 2.0. *I'd like to add the macro to* Ami Pro's *SmartIcon display. Can you tell me how?*
Kevin Phillips
Baltimore, Maryland

A. First, select *Tools SmartIcons*. In the dialog box, select *Customize*. In the next dialog box, select *Assign Macro*. Select *Next Icon* to page through the available icons. When the icon you want appears in the Selected Icon box, select your macro. Now, select *Save* and *OK*.

Back in the SmartIcon dialog box, drag the button you chose into the Current Palette section and drop it. Select *OK* twice, and you're done. Now, whenever the SmartIcon display appears, you can simply select the new button to print your envelope.

Send your word processing questions to George Campbell, CompuServe 71571,222; MCI Mail GCAMPBELL; 415/442-1891 (fax); or mail them to Word Processing Clinic, PC World, *501 Second St. #600, San Francisco, CA 94107.* PC World *pays $50 for published questions. Sorry, we cannot acknowledge submitted materials.*

George Campbell is a contributing editor for PC World.

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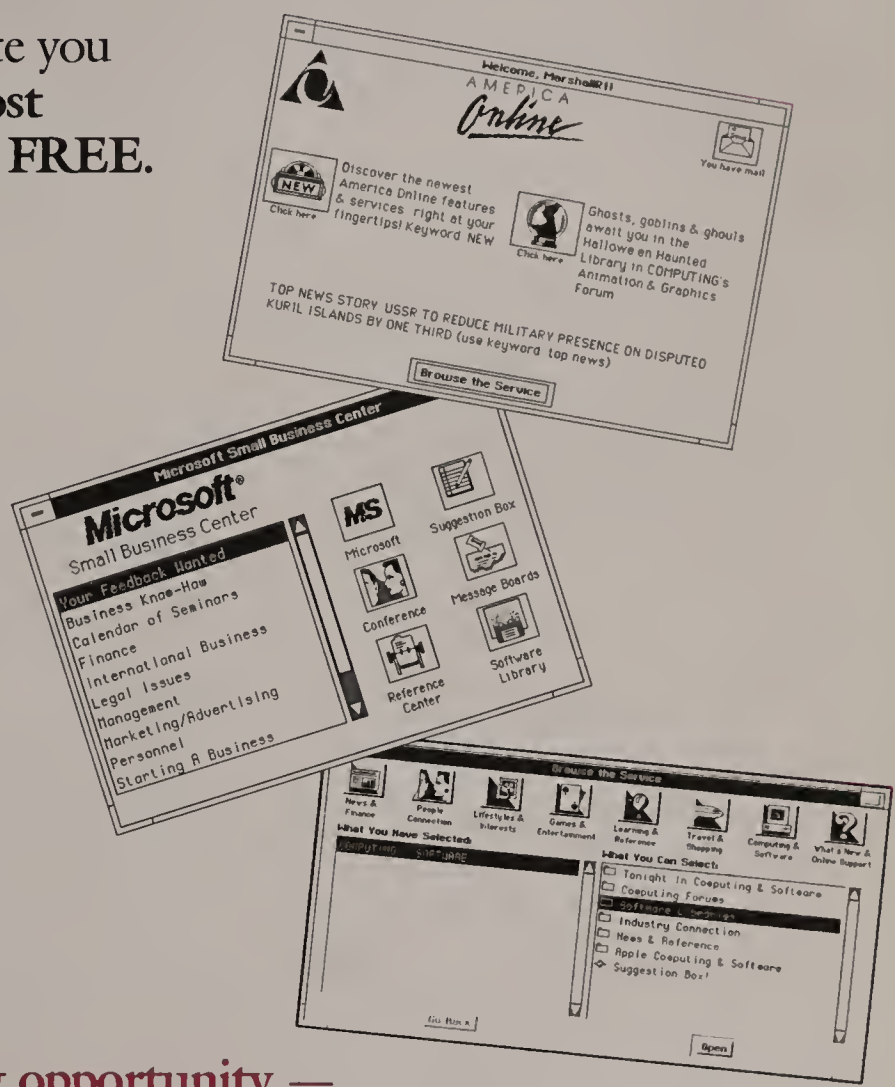

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DATA BASICS

Tips and techniques for managing your data

Steve Cummings

Q. *Our distribution company sells primarily to resellers, but we occasionally make bulk sales to buying clubs and individuals who must pay sales tax. How can we set up our invoicing system in* dBASE IV *to add sales tax automatically, but only to the appropriate invoices?*

Geraldine Gerald
Lodi, California

A. Thanks to *dBASE*'s IIF() (immediate if) function, your invoices can tell whether sales tax is necessary. First, to separate taxable customers from nontaxable ones, add a logical field called Taxable to your CUSTOMER file. Since your typical customer is a reseller, type **REPLACE ALL Taxable WITH .F.** at the dot prompt to identify all your existing customers as nontaxable, then go through the file and change the Taxable field to true for those who must pay tax. To prepare for future entries, add the Taxable field to your customer data entry form, and use the *Fields Edit options Default value* command to make *false* the default entry.

When you design your invoice in the report generator, use the *Fields Add field Calculate* command to create a Subtotal field that adds the extended prices (quantity times unit price) of all the items on the invoice. With the same command, set up a Sales_Tax field just below Subtotal; if your state's sales tax is 7.25 percent, enter the field's expression as something like **IIF(Customer>Taxable, Subtotal*.0725,0)**.

What does this expression do? If the customer's Taxable field is set to true—i.e., if the customer is not a reseller—the expression calculates the sales tax due. If the field is set to false, the expression places a 0 in the Sales_Tax field. Of course, you'll need a third calculated field, Total, to add Subtotal and Sales_Tax together.

The same general approach works well for businesses that sell both taxable and nontaxable items. In that case, though, you'd place a Taxable logical field in the inventory file and calculate the sales tax item by item, based on each item's extended price.

Q. *Our direct marketing firm is preparing to use* Paradox *to record product orders. Although we'll be getting a monthly report set up by our consultant, I'd like to monitor the success of our advertising more often. Is there a quick way I can graph total sales of each product, broken down by advertising method (newspaper, radio, TV, and so forth)?*

William Wong
Salem, Massachusetts

A. I'll assume you've already set up a line-item table with columns (fields) for the product, the quantity ordered, and the advertising method that brought in the business. You could summarize data from this table into a fancy report, but *Paradox*'s cross-tabulation feature is

Viewing Crosstab table: Record 1 of 4

1	Crosscut saw	1	DMail
2	Ripsaw	2	DMail
3	Ballpeen hammer	4	Newsp
4	Ballpeen hammer	1	Radio
5	Crosscut saw	3	TV
6	Crosscut saw	2	Newsp
7	Crosscut saw	1	Radio
8	Brace and bit	3	TV
9	Crosscut saw	1	TV
10	Ripsaw	5	TV
11	Brace and bit	4	DMail
12	Ballpeen hammer	1	Radio
13	Ballpeen hammer	3	TV

1	Ballpeen hammer	511	998	669	461
2	Brace and bit	1314	202	812	15
3	Crosscut saw	998	43	113	556
4	Ripsaw	352	622	132	1326

SCREEN 1: A cross-tab report, like this one taken from a three-field Paradox table, can show you the relationship between the types of products sold and the advertising method used.

ANTHONY RUSSO

the easiest way to get just the information you need.

Cross-tabulation groups the values in a given column—in this case, the Quantity column—into categories determined by two other columns—here, those for the product and the advertising method. Most often, as in your situation, cross-tabulation simply adds all the values in each of these categories, giving you a category-by-category summary of the entire table. However, you can also use *Paradox*'s CrossTab command to find the highest or lowest value in each category, or simply to count the number of records that fall into that group.

Used correctly, cross-tabulations use three—and only three—data columns. The *Paradox* cross-tabulator may, depending on column order, give you unwanted results on tables with more than three columns, automatically creating more categories in the breakdown than you'd intended.

To avoid this, use the *Ask* command to create an answer table with only three fields: Product, Quantity, and Advertising method (see the table at the top of **SCREEN 1**). As in the example table, the Advertising method column must be to the right of the Product column—it doesn't have to be immediately to the right, but it must be to the right. If your table isn't structured this way, press **<Ctrl>-R** to rotate the column order until it is.

Once the answer table is on screen, press **<F10>** to activate the main menu, then select *Image Graph CrossTab SUM*. *Paradox* will prompt you to identify in turn the three columns to be used in creating the cross-tabulation table: the column that will become the row labels, the one for column labels, and the one containing the values that will be summed. Select *Product, Advertising method,* and *Quantity,* respectively, by moving the cursor to each field and pressing **<Enter>**.

As soon as you press **<Enter>** on Quantity, *Paradox* will generate a cross-tab table much like the one at the bottom of **SCREEN 1**. You'll be able to see at a glance how many orders of each product were generated by each type of advertising.

Numbers, by themselves, are always the best way to examine data. To turn this information into a graph, press **<Ctrl>-<F7>**.

Send your questions to Data Basics, PC World, *501 Second St. #600, San Francisco, CA 94107; CompuServe 74055,412; MCI Mail 179-3813; 415/442-1891 (fax).* PC World *pays $50 for published questions. Sorry, we cannot acknowledge submitted materials.*

Steve Cummings is the author of Understanding Quicken *(Sybex, Alameda, California, 1990) and a contributing editor for* PC World.

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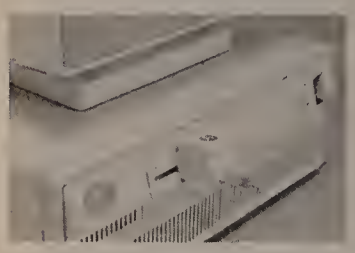

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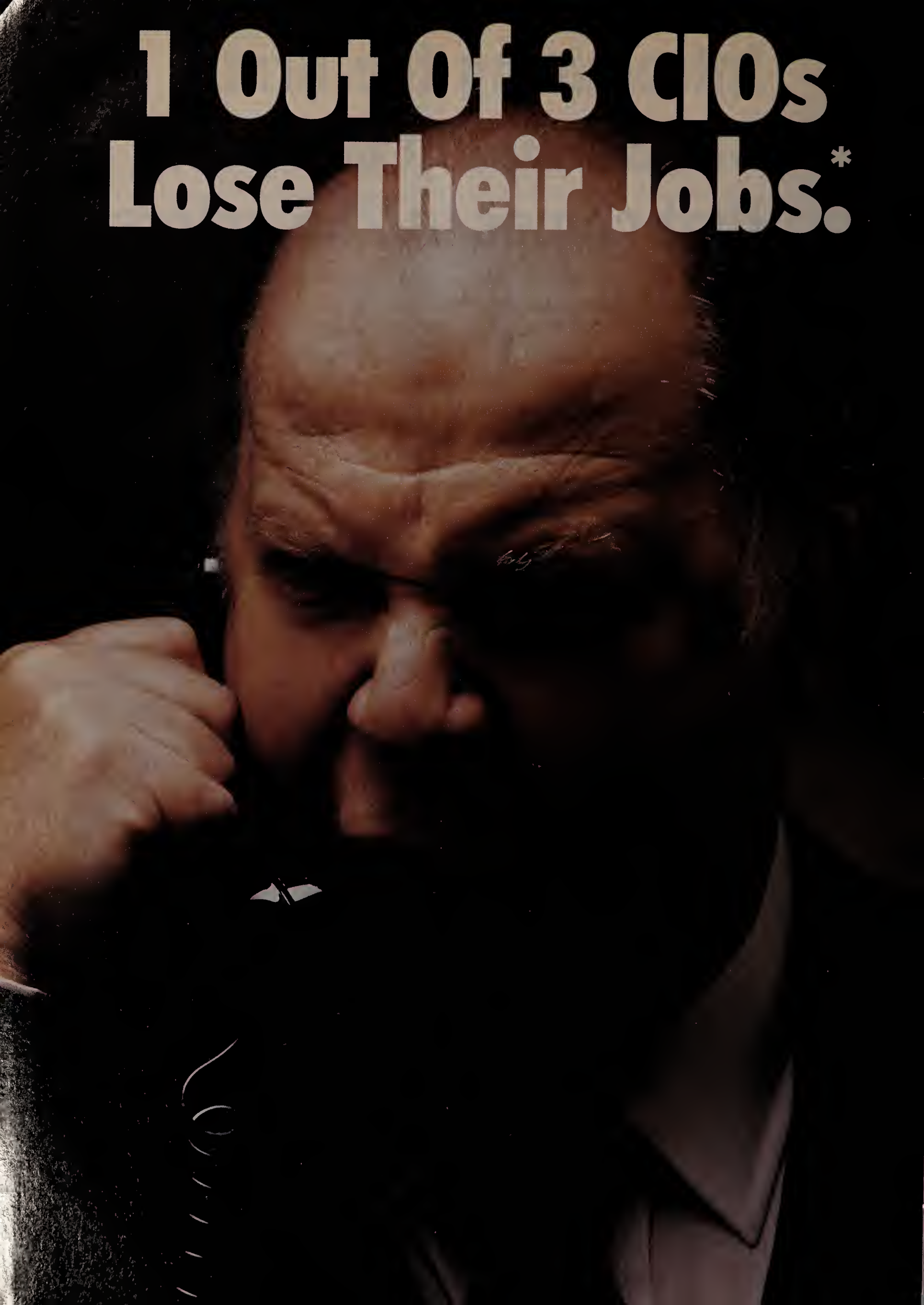

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*Source: *Computerworld* article, February 1991

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PUBLISHING & PRESENTATIONS

Expert advice for creating high-impact documents and presentations

Richard Jantz

Good design is just as important in business documents as it is in newsletters and product brochures. Businesspeople typically limit themselves to commonly used formats, especially when documents include income statements, balance sheets, or other financial materials. Yet with just a few basic enhancements, you can improve a financial report's appearance—and, in turn, strengthen your business's image.

This month, we've selected an annual financial report produced by the Gulf Coast Waste Disposal Authority, a Houston, Texas, environmental service organization. Our challenge was to make this document less intimidating and more readable while maintaining its professional tone. We used *Ventura Publisher* (the same program the Authority used), but you can get the same results with other packages.

Like many financial reports, this 150-page document consists primarily of tabular charts and text; few graphics or photos enliven the gray pages. The margins are too narrow and the justified body copy is too wide for easy reading. The proper line width for text depends upon the type's design and

Before

GULF COAST WASTE DISPOSAL AUTHORITY

NOTES TO THE FINANCIAL STATEMENTS

December 31, 1989

The Risk Reserve Fund - Casualty Insurance is being funded to a level of $200,000 in two annual increments of $100,000, beginning in 1989. The fund provides first dollar coverage of claims up to the casualty insurance policy's deductible amounts of $10,000 for general liability, $1,000 for automobile liability and $10,000 for public official liability. The annual payments into the fund are allocated to the operating funds on the same basis as the actual liability insurance premiums. There have been minor claims under general liability.

28. Compensated Absences Fund

In order to provide funding for the Authority's liability to its employees for accrued vacation and leave, the Compensated Absences Fund was established during 1987. This internal service fund assumed the total vested liability to all GCWDA employees as of June 30 and recorded a receivable from the individual funds (see note 9). The liability to employees was removed from the enterprise funds and the General Long-Term Debt Account Group.

On each pay period, the vested amount accrued by each employee is paid from the appropriate fund to the Compensated Absences Fund. Except for the Washburn Tunnel Facility, when the employee takes vacation or leave, the total vested portion is drawn from the Compensated Absences Fund. Because Washburn Tunnel is paying the unfunded past service liability as it is paid to the employee, only the funded portion of the vacation or leave paid to the Washburn Tunnel employee is drawn from the Compensated Absences Fund.

29. Restatements

The financial statements of the General Fund, combined special revenue funds, combined enterprise funds and combined internal service funds for the year ended December 31, 1988 have been restated to correct an error for the omission of accrued personnel costs as of the beginning and end of the year. In special revenue funds which are operated on a cost reimbursement basis, this restatement also corrected an error in the accrual of revenue receivable from participants. The effects of these restatements on the All Funds and Account Groups - Combined Balance Sheet were to increase total assets and other debits by $156,622, total liabilities by $306,976 and decrease total fund equity by $150,354, as shown below.

	Increase (Decrease)		
	Total Assets	Total Liabilities	Fund Equity
All Funds			
General Fund	$ –	$ 64,150	$ (64,150)
Special Revenue Funds			
Washburn Tunnel Facility	56,802	56,802	–
40 Acre Facility	22,565	22,565	–
American Facility	33,294	33,294	–
Blackhawk Facility	7,916	7,916	–
Municipal Operations	–	25,835	(25,835)
Campbell Bayou Solid Waste Landfill	8,278	8,278	–
Galveston Solid Waste Transfer Station	–	8,476	(8,476)
Enterprise Funds			
Bayport Area System Revenue Fund	–	43,132	(43,132)
Equipment Services	–	3,186	(3,186)
Billing Services	–	4,047	(4,047)
Vince Bayou Terminal	–	1,528	(1,528)
Internal Service Funds			
Compensated Absences Fund	27,767	27,767	–
Totals	$ 156,622	$ 306,976	$ (150,354)

58

After

A two-column format (each column 19 picas wide with 2 picas between them) replaces the single-column (45-pica) format and adds space for the outside margin (1¼ inches compared with ½ inch). Narrower columns make the 10-point Times Roman body copy easier to read.

To highlight the section heading, we used a different typeface and type size (15-point Helvetica Bold instead of 10-point Times Roman Bold); we also eliminated the unnecessary rule below it.

Boldface type accentuates the table headings. We separated major table headings from section heads by using a different typeface set in caps (Helvetica Bold instead of Times Roman Bold) and by increasing the indents of the section heads and section line items.

ANTHONY RUSSO

point size, but the general rule is, the smaller the type, the shorter the line. A good maximum line width is twice the type's point size measured in picas. For example, 10-point type should be set no wider than 20 picas.

To improve this document, we widened the outside margins, changed from single-column format to two columns, and used more rules and contrasting type within the tabular charts. The two-column format allows for the wider margin and provides a shorter, easier-to-read line. It also permits more layout options for dressing up the material. For example, it's easier to fit lists and smaller tables into a narrower column. Finally, we redesigned the table, using different type styles for the major section heads and adding horizontal rules to distinguish each major section.

Redesigning a lengthy financial report takes time, but it probably doesn't require any tools you don't already have. And the results pay off.

Send your publishing and presentations questions as well as business document and presentation makeover candidates to Richard Jantz, MCI Mail RJANTZ; 415/442-1891 (fax); or mail them to Publishing & Presentations, PC World, *501 Second St. #600, San Francisco, CA 94107.* PC World *pays $50 for published questions. Sorry, we cannot acknowledge submitted materials.*

Contributing editor Richard Jantz is the author of Ventura Publisher 4.0: Beyond the Basics *(John Wiley & Sons, New York, 1991). Larry Westdal, a graphic designer with Westdal Design Associates in Berkeley, California, also contributed to this article.*

GULF COAST WASTE DISPOSAL AUTHORITY

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December 31, 1989

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Internal Service Funds			
Compensated Absences Fund	27,767	27,767	—
TOTALS	$ 156,622	$ 306,976	$ (150,354)

58

In the original document, the company name lacks distinction. To set it off, we stretched its letterspacing so it spanned the page and replaced one double rule with a thicker, 1-pica rule.

To separate the subheads from the text in the new two-column format, we set them in all caps using a different typeface (10-point Helvetica Bold instead of 10-point Times Roman Bold).

To guide the eye in reading the table charts, horizontal rules divide the major sections.

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COMMUNICATIONS Q&A

On-line resources for business and professional users

Judy Heim

Q. *Is there any* Windows *communications package that automates the downloading of files and messages from CompuServe (CIS)? —Jeffrey Seligman, Thousand Oaks, California*

A. Unfortunately there isn't, but *TAPCIS*'s manufacturer, the Support Group, is readying a *Windows* version for release soon—and CompuServe plans a spring release of its front end, *CompuServe Information Manager,* for *Windows*. Meanwhile, you can always run *TAPCIS* under *Windows* in a DOS window. Just use the PIF file found in the TAPCIS Support Forum on CIS (enter **GO TAPCIS**). Look in the Scripts & Tools library, and scan for TAPCIS.PIF.

Q. *Is there an on-line source that lists 10-K and 10-Q reports of publicly held companies the day they're filed with the SEC? —John Seeger, Lafayette, Louisiana*

A. Yes, the Federal Filings news wire on Dow Jones News/Retrieval makes SEC filings available on line, including company reports. The data base costs $2.85 per minute for 2400-baud access during the day and $1.80 per minute at night. There is an additional charge of 60 cents and 18 cents respectively for each 1000 characters displayed. A Dow Jones subscription costs $29.95 plus an $18 annual fee.

Q. *When I know I'm going to be working at home, I leave the host mode of* Procomm Plus *loaded and running at work so I can dial in to my office PC and run software remotely. I'd like to use the same technique to debug some data base software my firm has developed for a client. Unfortunately, the data base needs so much RAM that I can't load it while* Procomm *is running. Are there any "remote control" programs that will let me access more of the remote PC's memory? —Eric Silver, Missoula, Montana*

A. Roger Schlafly of Soquel, California, has devised a way to set up the popular $39 shareware communications program *Telix* so you can log on to the PC that's running it, "shell out" to DOS, remove *Telix* from memory, then access all the PC's memory—except for whatever DOS is using. As far as I know, *Telix* is the only package that can do this neat trick.

Create a batch file by typing the following into your text editor. Save it in ASCII format as *HOST.BAT,* and copy it into the subdirectory containing *Telix.*

```
:TELIX
C:
CD \TELIX
TELIX O SHOST
IF ERRORLEVEL 120 GOTO DOS
GOTO DOS
:SHELL
CTTY COM1
COMMAND
CTTY CON
GOTO TELIX
:DOS
REM Ending host mode.
```

Change line 3 of the script (CD \TELIX) to refer to the directory containing your copy of *Telix.* Change line 8 to **CTTY COM2** if you use COM2 instead of COM1.

Now use your editor to load *Telix's* host script, HOST.SLT. Find the line that begins 'Type EXIT' (it's around line 555), and just beneath it type the line **EXITTODOS(120,0)**. Save the file. Compile it with *Telix's* compiler by typing **CS HOST** and pressing **<Enter>** at the DOS prompt.

To run *Telix* in its new host mode, simply type **HOST** from the DOS command line. Now when you log on from your home PC, you can escape to DOS and access all the remote PC's memory. You won't, however, be able to run programs that write directly to screen, such as *Microsoft Word.* For that you need a special-purpose remote program like *Close-Up. Telix* is available from Exis, Inc., P.O. Box 130, West Hill, Ontario M1E 4R4 Canada; 416/289-4641, 416/289-4645 (fax).

Send your communications questions to Judy Heim, CompuServe 71570, 3712; GEnie JUDY.HEIM; MCI Mail 312-7737; Internet 3127737@MCI-MAIL.COM; 415/442-1891 (fax); or mail them to Communications Q&A, PC World, *501 Second St. #600, San Francisco, CA 94107.* PC World *pays $50 for published questions. Sorry, we cannot acknowledge submitted materials.*

Judy Heim is a contributing editor for PC World.

ANTHONY RUSSO

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DesignCAD is the software used in the design of Andre Agassi's tennis rackets, the Patriot missile, and scores of other high tech, low tech, and no tech products.

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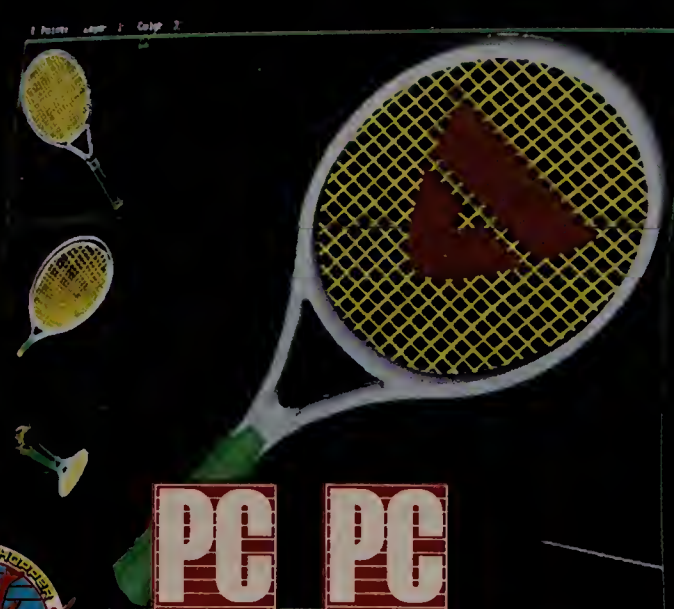

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USER GROUP TIPS

Helpful hints from members of the nation's user groups

WARD SCHUMAKER

COPY Gets ASCII Files Together

Combine groups of ASCII files, such as E-mail notes, into single archive files, and you'll have a less cluttered disk. And one large file takes up less disk space than lots of little ones. To combine files, type **COPY** and a space followed by your list of files, separating each file name with a plus sign (+). Finish the command with a space followed by a name for the archive file. Suppose you have three different memos about December purchases, MEMO.1, MEMO.2, and MEMO.3, and you'd like to save them together as PURCHASE.DEC. Check your directory to make sure you won't overwrite an existing file. Then enter **COPY MEMO.1 + MEMO.2 + MEMO.3 PURCHASE.DEC** at the DOS prompt. Make sure you include an archive name. If you don't, DOS uses the first file name, and if you delete the component files, you delete your archive file as well. To view your archive, enter **TYPE PURCHASE.DEC | MORE**, and you'll see the text from all three files contained in one file. If you have more than one screen full of text, press **<Enter>** to scroll. Now you can delete the individual files you combined to create the archive file.

Cary Jensen and Loy Anderson
Houston Area League (HAL) PC

ANTHONY RUSSO

Free Batch Screen Blanker

I find it distracting to have the display turn itself off when I'm proofing work or debugging a problem. So I wrote this batch file that lets me choose my time to blank the screen and named it CL.BAT:

```
LS
PAUSE > NUL
EXIT
```

At the DOS prompt, enter **CL** to blank the screen and leave just the blinking cursor. Tap a key to get back to the DOS prompt or return to your application if you've shelled out to DOS. Store this file with your other batch files in a directory listed in the PATH statement in your AUTOEXEC.BAT file.

Bill Weil
San Francisco PC Users Group

Print Readable Envelopes With the LaserJet III

When printing envelopes on an HP LaserJet III, you may have to reset the toner density dial to get crisp, dark type. To do so, raise the cover as if you were changing the toner cartridge. The dial is to your left in the top front corner: Note its setting, and then turn it to 1 for maximum density. After printing the envelopes restore the dial to its original setting to avoid wasting toner.

Christine Rivera
NYPC

A WordPerfect Macro Alternative

It's tedious to type a phrase repeatedly while preparing a document, but who wants to create a macro that may never be used again? Instead, block the expression along with its trailing space and press **<Ctrl>-<Page Up>** to bring up the Variable prompt. Enter a number from 0 to 9, and the next time you need to repeat the phrase, hold down **<Alt>** and press the number you chose. These variables hold up to 128 characters. And when you exit they disappear, so you don't have to worry about a glut of useless macro files on your disk.

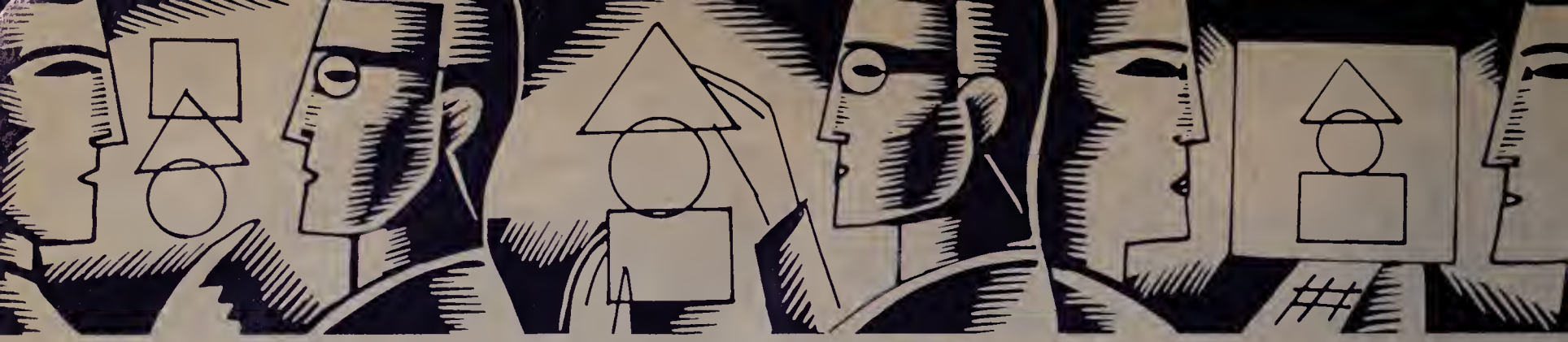
Thomas M. Taulli
Pasadena IBM Users Group

The Absolute Range for Great 1-2-3 3.1 Output

When changing the attributes on text you're printing with *1-2-3 3.1*, you usually have to highlight the range once before every change. So if you want a header in a 24-point bold, italic, outlined, shaded font in a shadowed box, you have to highlight the same range six times! To avoid this nuisance, press **<F4>**, and enter the range you want to change. Then you won't have to reselect the range to make multiple changes for the same text. To cancel the range selection, press **<Esc>** in Ready mode.

Carroll J. Seitz
NESTU of New Jersey

User group members—please submit your tips to User Group Tips, PC World, *501 Second St. #600, San Francisco, CA 94107; CompuServe 74055,412; MCI Mail PC World Editorial; or 415/442-1891 (fax). Include your phone number and the name of your group. We pay $50 and throw in a* PC World *T-shirt for each tip we use.*



STAR-DOT-STAR *.*

A global exchange of personal computer discoveries

Edited by Brett Glass

Run Your Printer Backward

As do many printers, my HP DeskJet 500 stacks printed pages right side up. Thus, when it finishes printing a 30-page draft in *WordPerfect 5.1,* for instance, the last page is on top, and the entire stack has to be re-sorted to place the pages in the correct order.

I realized that if I could print the document backward, starting with the last page and ending with the first, the resulting output would be in the right order. I therefore wrote a *WordPerfect* macro, REVPRINT for REVerse PRINT [see **FIGURE 1**] to do just that. REVPRINT goes to the bottom of the document, prints that page, and then alternates between paging up and printing the current page until it reaches page 1. REVPRINT doesn't need to know in advance how many pages the document contains.

REVPRINT uses macro-specific commands, so you can't create it by simply recording keystrokes; you must use the macro editor. To get to this editor, press **<Home>**, then **<Ctrl>-<F10>**. At the 'Define macro' prompt, type **REVPRINT** and press **<Enter>**; at the 'Description' prompt, type **Prints backward** and press **<Enter>** again. You're now ready to create the macro.

The first command, {DISPLAY OFF}, is already there. Press **<Right>** and **<Enter>** to get past it. To enter {HOME}, {DOWN}, and {PAGE UP} into the macro, press **<Ctrl>-V** followed by the appropriate command key. To enter the {WHILE}, {END WHILE}, and {SYSTEM} commands, press **<Ctrl>-<PageUp>**, select the command on the resulting pop-up list, and press **<Enter>**. Insert {PRINT} by pressing **<Shift>-<F7>**. Type the remainder of the text as it appears. Press **<F7>** to exit the macro editor. To run the macro, press **<Alt>-<F7>**, type **REVPRINT**, and press **<Enter>**.

Jerry L. Stern
Baltimore, Maryland

```
{DISPLAY OFF}
{Home}{Home}{Down}
{WHILE}{SYSTEM}page<1
{Print}P{Page Up}
{END WHILE}
{Print}P
```

FIGURE 1: This WordPerfect macro prints a document's pages backward. They wind up in the correct order in the bin of a printer that stacks its output face up.

ANTHONY RUSSO

Making the Grade in Your Spreadsheet

I'm a college teacher, and use *Quattro Pro* to do my record keeping. Because I prefer to enter and read grades as letters (for example, B+) but need a numerical equivalent to compute averages, I wanted a formula to convert a letter grade to its corresponding number. The task was complicated by the fact that D and F are consecutive grades but are separated by a letter alphabetically.

When I build a spreadsheet to hold class records, I put the alphabetic grades from each assignment or exam in one column. In another column, I type the formula **(69 -@CODE(***address***) + @ABS(69 - @CODE(***address***)))/2 + @IF(@MID(***address***,1,1) = "+", .3, (@IF(@MID(***address***,1,1)="-", -.3, 0)))**, where *address* is the cell address containing the letter grade. The result of this formula is the grade converted to a number. I then average the converted grades and show grade point averages next to the block of letter grades.

Lewis D. Blake III
Durham, North Carolina

Editor's note: Mr. Blake happens to be a Quattro *user, but you don't need* Quattro *to use this technique.* Reflex, 1-2-3, *and many other programs have identical @ABS, @CODE, and @MID functions and can use this formula with few or no changes.*

But be warned: The macro is case sensitive—the letter grades must be entered as capital letters. Also, this formula will give you an absurd result for characters outside the A-to-F *range and will return an error if the cell to be converted is empty.*

BASIC Key Code Decoder

Programs often need to know what key the user just pressed. If the key in question happens to be a letter, number, or punctuation symbol, your BASIC programs should have no trouble recognizing it from its ASCII code. But function and cursor-control keys don't have ASCII codes; your program must recognize them by their scan codes.

To find out quickly how to recognize

```
10 SCREEN 0: CLS : COLOR 15, 0: X = 22: LOCATE , , 0: KEY OFF
20 LOCATE 1, 1: PRINT "┌──────────────────────┐          ┌──────────────────────┐"
30 LOCATE 2, 1: PRINT "│      Scan code       │          │      ASCII code      │"
40 LOCATE 3, 1: PRINT "└──────┬───────┬───────┘          └──────┬───────┬───────┘"
50 FOR Y = 4 TO 22
60 LOCATE Y, 1: PRINT "                │       │                  │       │"
70 NEXT Y
80 LOCATE 23, 1: PRINT "                └───────┘                  └───────┘"
90 A$ = INKEY$: IF A$ = "" THEN GOTO 90
100 LOCATE X, 9: PRINT "                    "
110 IF X = 22 THEN X = 4 ELSE X = X + 1
120 LOCATE X, 4: PRINT "        "
130 LOCATE X, 20: PRINT "        "
140 IF LEN(A$)>1 THEN GOTO 170
150 REM Print ASCII CODE if available
160 LOCATE X, 20: PRINT STR$(ASC(A$)): GOTO 190
170 REM Print scan code if available
180 LOCATE X, 4: PRINT STR$(ASC(RIGHT$(A$, 1)))
190 LOCATE X, 9: PRINT "<--------->"
200 GOTO 90
```

LISTING 1: Run this program in QuickBASIC or QBASIC to get the scan codes or ASCII codes for the keys on your keyboard—important information when writing other programs.

any key, I wrote KEY.BAS [see **LISTING 1**]. To use it, run KEY.BAS from *QuickBASIC* or the DOS 5.0 QBASIC, and press the key you want to detect. If the key can be detected only by its scan code, that's what you'll see on the left, otherwise, you will see its ASCII code on the right.

Yaniv Kunda
Ramat-Hasharon, Israel

Editor's note: I've enhanced Mr. Kunda's program to add an arrow next to the code for the most recent key typed and to make the screen display easier to understand. To exit the program at any time, press **<Ctrl>-<Break>**.

This tip works because of the QuickBASIC INKEY$ function's idiosyncrasies. INKEY$ returns an empty string if no key has been pressed, a string with a single character if an ordinary key was pressed, or a string with two characters if a special key (such as a function key) was pressed. If an ordinary key was pressed, the string contains its ASCII code. In the case of a special key, the first character of the string is always a NUL (ASCII code 0), and the second contains the scan code of the key.

One way to interpret the results of the INKEY$ function in your own program is shown in **LISTING 2**. *It uses an ON...GOTO statement to look repeatedly for keyboard input and determine what kind of key, if any, was pressed.*

When the user presses a character key, the program jumps to the ORDINARY label; when the user presses a function or cursor-control key, the program goes to SPECIAL. The code in **LISTING 2** *shows what might follow an ORDINARY label where the user is allowed to press A, B, or C to choose a menu item, as well as a SPECIAL label where he or she can press <F1> through <F10>.*

"Weally in Windows" Correction

In the December *Star-Dot-Star*, Listing 4 was incorrectly printed. The listing was for a debug script which, when run, creates a program that checks whether or not you are running in Windows. The correct script is here in **LISTING 3**.

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Circle 25 on reader service card

```
POLL:
A$ = INKEY$
ON (LEN(A$) + 1) GOTO POLL, ORDINARY, SPECIAL
ORDINARY:
REM Convert key to a number: 1 for A, 2 for B, and 3 for C.
ORDKEY% = (ASC(UCASE$(A$)) – ASC("A") + 1)
REM If key is not A, B, or C, go back to POLL for the next key.
IF ORDKEY% < 1 OR ORDKEY% > 3 THEN GOTO POLL
REM Go to the routine for the pressed key.
ON ORDKEY% GOTO AKEY, BKEY, CKEY
SPECIAL:
REM Get scan code out of A$. Deduct 58 to get 1 for F1, 2 for F2, etc.
FKEY% = ASC(RIGHT$(A$,1) – 58
REM If key is not F1 through F10, go back to POLL for the next key.
IF FKEY% < 1 OR FKEY% > 10 THEN GOTO POLL
REM Go to the routine for the pressed key.
ON FKEY% GOTO F1, F2, F3, F4, F5, F6, F7, F8, F9, F10
AKEY:
PRINT "Key A was pressed.": GOTO POLL
    :
CKEY:
PRINT "Key C was pressed.": GOTO POLL
F1:
PRINT "Key F1 was pressed.": GOTO POLL
    :
F10:
PRINT "Key F10 was pressed.": GOTO POLL
```

LISTING 2: These sample BASIC routines demonstrate how your program can read "ordinary" and "special" keystrokes. Use modified versions in your own programs.

Have you come up with a macro, batch file, short program, utility, or general tip that you're proud of? Star-Dot-Star pays $25 to $200 for each tip used. Send your tips to Star-Dot-Star, PC World, *501 Second St. #600, San Francisco, CA 94107; CompuServe 74055,412; MCI Mail PC World Editorial; or 415/442-1891 (fax). Sorry, we cannot acknowledge submitted materials.*

Brett Glass is a contributing editor for PC World.

```
N InWinEQ1.com
E100 A1 2C 00 8E C0 BF 00 00 26 8A 05 3C 00 74 25 BE
E110 3D 01 8A 1C 80 FB 00 74 16 26 8A 05 3A C3 75 04
E120 47 46 EB EE 47 26 8A 05 0A C0 75 F8 47 EB D9 C6
E130 06 3C 01 01 B4 4C A0 3C 01 CD 21 00 00 77 69 6E
E140 64 69 72 3D 00
RCX
45
W
Q
```

LISTING 3: Run this script through DEBUG to get InWinEQ1, a Windows-testing program.

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For use with PC World Instant Reference Card Portfolio

BASICS: QUICKEN 4.0

What to do: When you start *Quicken*, the Main Menu appears. This is the beginning and ending point of all *Quicken* activities. Begin by setting up a bank account and entering some checks or transactions.

USING THE MENU

Select option	Highlight option, press **<Enter>**; or type option number or letter
Return to Main Menu	**<Esc>** until Main Menu shows

Note: After an option from the Main Menu is selected, pulldown menus are available as listed here:

Open Account/Print menu	**<F2>**
Open Edit menu	**<F3>**
Open Quick Entry menu	**<F4>**
Open Reports menu	**<F5>**
Open Activities menu	**<F6>**
Close menu or cancel activity	**<Esc>** until desired menu or screen

GETTING STARTED

Create first account	Write/Print Checks (**1**) or Register (**2**), select type of account and directory, complete Set Up New Account window
Create checks	Write/Print Checks (**1**), fill in check data
Record transaction	**<Ctrl>-<Enter>** or **<F10>**
Quit *Quicken*	Return to Main Menu, **E**
Back up and quit	Return to Main Menu, **<Ctrl>-E**
Back up and continue	Return to Main Menu, **<Ctrl>-B**
Use DOS	**<F6>**, Use DOS (**5**), type **Exit** and press **<Enter>** to return to *Quicken*

GETTING AROUND

Note: A blank is a field or line on a form in which you enter data.

Go to beginning of current blank	**<Home>**
Go to end of current blank	**<End>**
Go to next blank	**<Tab>** or **<Enter>**
Go to previous blank	**<Shift>-<Tab>**
Move right one word	**<Ctrl>-<Right>**
Move left one word	**<Ctrl>-<Left>**
Go to first blank of transaction	**<Home><Home>**
Go to last blank of transaction	**<End><End>**
Go to first transaction in file	**<Home><Home><Home>** or **<Ctrl>-<Home>**
Go to last transaction in file	**<End><End><End>** or **<Ctrl>-<End>**

Write\Print Checks

Display next check	**<Page Down>**
Display previous check	**<Page Up>**

Register

Go to next transaction	**<Down>**
Go to previous transaction	**<Up>**
Display next screen	**<Page Down>**
Display previous screen	**<Page Up>**
Display next month's transactions	**<Ctrl>-<Page Down>**
Display previous month's transactions	**<Ctrl>-<Page Up>**

USING HELP

Get context sensitive help	**<F1>**
Display help topic list	**<F1><F1>** or **<Ctrl>-<F1>**
Cancel help	**<Esc>**

EDITING

Note: You can edit transactions while in the Write/Print Checks or Register screen.

Deleting

Delete character under cursor	**<Delete>**
Delete character to left	**<Backspace>**
Delete contents of blank	**<Ctrl>-<Backspace>**
Delete transaction	**<Ctrl>-D**

Adding/Changing Data

Insert/overtype toggle	**<Insert>**
Increase/decrease date	Go to Date blank, **+/-**
Increase/decrease check number	Go to Check Number blank, **+/-**
Copy payee to first Address line	Go to first space on first line of Address block, **"** (double quote)
Record changes	**<Ctrl>-<Enter>** or **<F10>**

Searching

Find next/previous transaction	**<Ctrl>-F**, fill in search criteria, **<Ctrl>-N/<Ctrl>-B**
Repeat Find next transaction	**<Ctrl>-F<Ctrl>-N**
Repeat Find previous transaction	**<Ctrl>-F<Ctrl>-B**
Find date	**<Ctrl>-G**, enter date, **<Ctrl>-<Enter>**
Clear search criteria	**<Ctrl>-D**

Calculator

Show calculator	**<Ctrl>-O**
Use calculator	Type number, type operator, repeat for all numbers, **<Enter>** to total calculation
Paste result in current blank	**<F9>**
Add/subtract a percentage	Type number, type **+/-**, type percentage numeral(s), type **%<Enter>**

Splitting Transactions

Note: You can split transactions that are made up of more than one category, such as a payment of principle and interest on a loan.

Split transaction	**<Ctrl>-S**, fill in data on split entries that make up the transaction, **<Ctrl>-<Enter>** to complete
Delete line of split	**<Ctrl>-D**
Record the split	**<Ctrl>-<Enter>**
Calculate split total, paste	**<F9>**

Miscellaneous Editing

Memorize transaction	**<Ctrl>-M**
Recall memorized transaction	**<Ctrl>-T**, **<Up>** or **<Down>**, to highlight desired transaction, **<Enter>**
Void transaction	Display transaction, **<Ctrl>-V**

Fold Here

Fold Here

PC WORLD

Instant Reference Card #20

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ADVANCED: QUICKEN 4.0

USING ACCOUNTS

Note: Accounts identify bank accounts, credit cards, cash accounts, and special accounts for other types of assets, liabilities, and investments.

Set up new account	**<Ctrl>-A**, or Select Account (**4**) from Main Menu, **<Home>** to highlight <New Account>, **<Enter>**, fill in Set Up New Account form
Edit existing account	**<Ctrl>-A**, or Select Account (**4**) from Main Menu, **<Up>** or **<Down>** to highlight account name, **<Ctrl>-E**, change Account form as needed
Set up new account group	**<Ctrl>-G** from Main Menu, **<Home>** for <Set Up New Grp>, **<Enter>**, fill in Set Up Account Group form
Delete account	**<Ctrl>-A**, or Select Account (**4**) from Main Menu, **<Up>** or **<Down>** to highlight account name, **<Ctrl>-D**

USING CATEGORIES

Note: Categories are used to identify transaction types, such as investments, mortgage, payroll, and rent. Categories are available in the Write\Print Checks or Register screen, or from the Quick Entry (<F4>) pulldown menu.

Select transaction category	**<Ctrl>-C**, **<Up>** or **<Down>** to highlight category, **<Enter>**
Delete category	**<Ctrl>-C**, **<Up>** or **<Down>** to highlight category, **<Ctrl>-D**
Change category	**<Ctrl>-C**, **<Up>** or **<Down>** to highlight category, **<Ctrl>-E**
Print category list	**<Ctrl>-C**, **<Up>** or **<Down>** to highlight category, **<Ctrl>-P**
Add new category	**<Ctrl>-C**, **<Home>** to <New Category>, **<Enter>**, Fill in form, **<Ctrl>-<Enter>**

USING CLASSES

Note: Classes help identify who, what, or when of transactions, for example to distinguish income from several rental properties. Transactions can have categories and/or classes applied to them. The combination provides alternate ways of looking at data.

Set up new class	**<Ctrl>-L**, **<Home>** to highlight <New Class>, **<Enter>**, fill in form
Change class data	**<Ctrl>-L**, **<Up>** or **<Down>** to highlight desired class, **<Ctrl>-E**, change form
Delete class	**<Ctrl>-L**, **<Up>** or **<Down>** to highlight desired class, **<Ctrl>-D**
Print class list	**<Ctrl>-L<Ctrl>-P**
Select first class	**<Home>**
Select last class	**<End>**
Scan list	**<Page Up>/<Page Down>**

RECONCILING ACCOUNTS

Reconcile account	Write/Print Checks (**1**) or Register (**2**), **<F6>**, Reconcile (**2**), fill in bank balances and transactions, **<Ctrl>-<Enter>**
Print previous reconciliation	Write/Print Checks (**1**) or Register (**2**), **<F6>**, Reconcile (**2**), **<F9>**

USING TRANSACTION GROUPS

Note: Transaction groups are recurring transactions that occur together because of date (for example, bills paid on the first of the month) or nonchecking entries, like depreciation. For a transaction to be included in a group, it must be memorized and then selected for the group.

List transaction group	**<Ctrl>-J**
Set up transaction group	**<Ctrl>-J**, highlight on <unused> line, **<Enter>**, fill in Describe Group form for all transactions in group, **<Ctrl>-<Enter>**, **<Up>** or **<Down>** on Assign Transaction list to highlight transaction for group, **<Spacebar>** on Transactions to assign to new group, **<Enter>** to complete
Delete transaction group	**<Ctrl>-J**, **<Up>** or **<Down>** to highlight group, **<Ctrl>-D**, **<Enter>**
Change transaction group	**<Ctrl>-J**, **<Up>** or **<Down>** to highlight group, **<Ctrl>-E**, **<Ctrl>-<Enter>** when finished, in Assign Transactions **<Spacebar>** to unassign or assign to a group, **<Enter>**
Execute transaction group	**<Ctrl>-J**, **<Up>** or **<Down>** to highlight group, **<Enter>**
Write check	**<Ctrl>-W**, **<Ctrl>-P** to print or **<Ctrl>-I** for Electronic Transfers

Fold Here

Fold Here

USING PRINTER SETTINGS

Change printer settings	**<F2>**, Change Printer Setting (**3**), Check (**1**)/Report (**2**)/Alternate Report (**3**), **<Enter>**, fill in desired printer settings, **<Ctrl>-<Enter>** to save
Select printer from list	**<F2>**, Change Printer Setting (**3**), Check (**1**)/Report (**2**)/Alternate Report (**3**), **<Enter>**, **<F9>** for list

Printing Checks

Print checks	**<Ctrl>-P**, fill in Print Checks form, **<Ctrl>-<Enter>**
Print sample check	Go to Print Checks, **<F9>**
Change number of copies	Go to Print Checks, **<F8>**, enter number
Change check type	Go to Print Checks, **<F8>**, select type

Printing Reports

Display personal report	Reports (**3**) from Main Menu or **<F5>**, Personal Reports (**1**), select report, enter title and date(s)
Display business report	Reports (**3**) from Main Menu or **<F5>**, Business Reports (**2**), select report, enter title and date(s)
Display investment report	Reports (**3**) from Main Menu or **<F5>**, Investment Reports (**3**), select report, enter title and date(s) and other info
Create custom report	Reports (**3**) from Main Menu or **<F5>**, select report (**5** though **8**), fill in form
Display memorized report	Reports (**3**) from Main Menu or **<F5>**, Memorized Reports (**4**)
Display report options	**<F8>** before displaying report
Select or filter transactions	**<F9>** before displaying report
Print report	**<F8>** after displaying report
Memorize report	**<Ctrl>-M**

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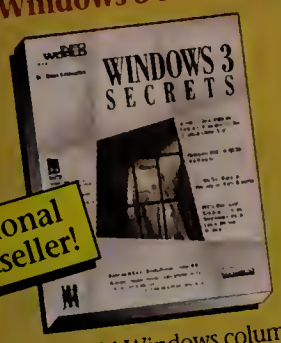

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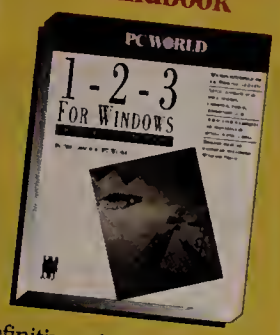

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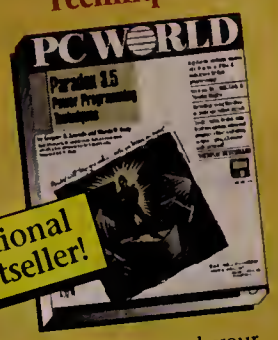

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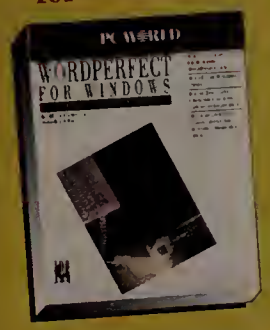

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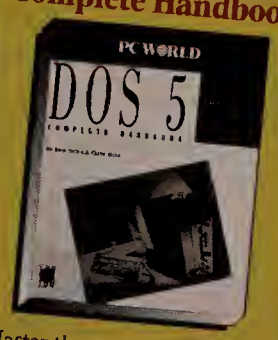

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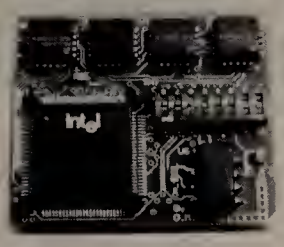

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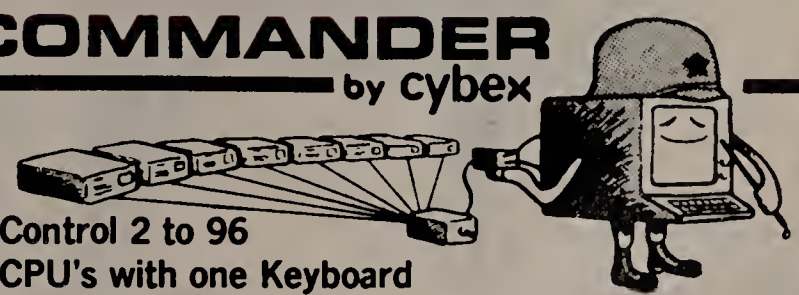

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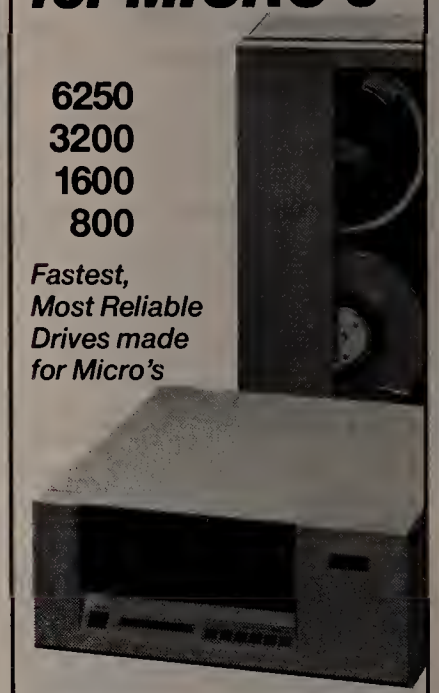

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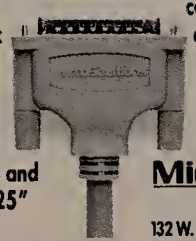

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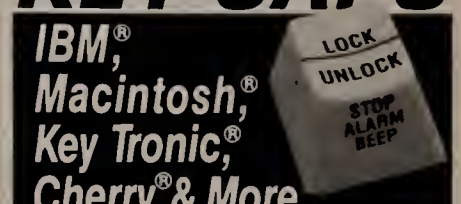

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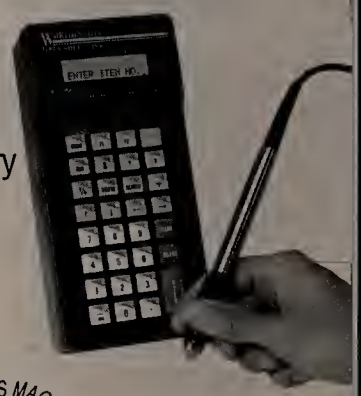

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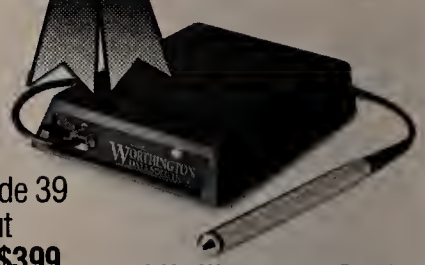

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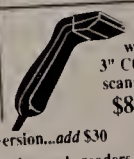

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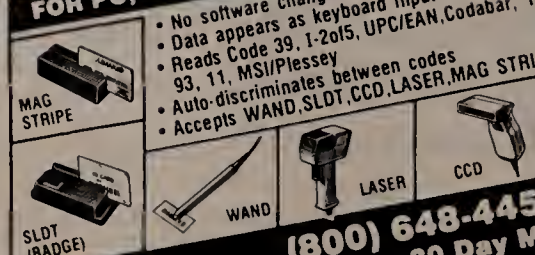

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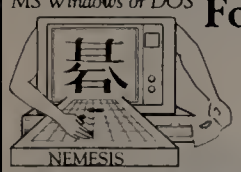

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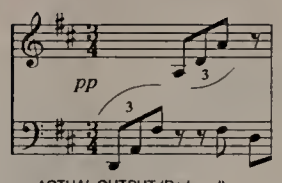

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FastData Power PCs

$2599 FastData 486/33

If you need the ultimate in 486 power, the FastData 486/33 delivers. A true Intel™ 486-33 processor with integrated coprocessor and 8K internal cache is complemented by a 128K external static RAM cache with burst mode support to deliver 14.7 MIPS of processing power. The system is expandable to 16 megabytes of memory on-board using 1mb SIMMS, thus protecting your investment in existing memory when you're ready to upgrade. The FastMicro team has bundled the 486/33 with four megabytes of memory, a high-speed 200mb IDE hard disk and a 1mb Super VGA adaptor and Non-Interlaced monitor at an attractive price. From networking to publishing to CAD, we have what it takes to make your computer a complete solution.

Standard Features

- ✓ 33mhz Intel 80486 processor wtih coprocessor.
- ✓ 8K processor & 128K external static RAM cache.
- ✓ 4 megabytes of fast RAM.
- ✓ 200 mb 18ms IDE hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" and 1.44mb 3.5" floppy drives.
- ✓ Full size or upright (shown) chassis with keylock, speed and reset buttons.
- ✓ 14" SVGA Non-Interlaced color monitor, 1024x768 resolution, with 1mb VGA card.
- ✓ Clock calendar, parallel port, two serial ports, and a game port.
- ✓ Key Tronic 101 key keyboard.
- ✓ 230 watt power supply
- ✓ 8 ISA slots, 5 drive bays.
- ✓ Windows & Mouse add $69.
- ✓ MS-DOS 5.0.
- ✓ FCC Class A approved for business use only.

486/33	80mb	100mb	200mb	340mb
Mono	$1,929	$1,999	$2,249	$2,649
Mono VGA	$2,029	$2,099	$2,349	$2,749
VGA 1024i	$2,229	$2,299	$2,549	$2,949
VGA 1024ni	$2,279	$2,349	$2,599	$2,999

FastData 386/33 $1799

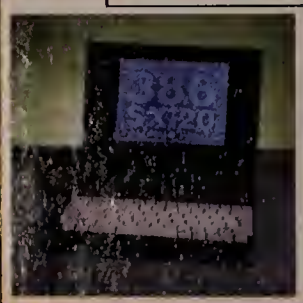
The fastest 386 processor available combined with a 64K thirty nanosecond memory cache make the FastData 386/33 a power users dream! Included in the base price is a 80 megabyte 20 millisecond hard disk, 1024 by 768 Non-Interlaced Super VGA monitor and card, four megabytes of memory, and 5.25" & 3.5" high capacity floppy drives. Plus, should anything ever go wrong with your FastData computer, you are covered by a one-year warrantee with free on-site service or system replacement if we cannot correct the problem with our FastSHIP advance parts replacement program.

Standard Features

- ✓ 33mhz Intel 386-DX processor.
- ✓ 64K high-speed memory cache.
- ✓ 4 megabytes high speed RAM.
- ✓ 105 mb 17ms IDE hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" and 1.44mb 3.5" floppy drives.
- ✓ Standard chassis (shown) or mini-tower with speed, keylock and reset buttons.
- ✓ 387-DX coprocessor socket.
- ✓ 200 watt power supply.
- ✓ 14" SVGA Non-Interlaced color monitor, 1024x768 resolution, with 1mb VGA card.
- ✓ Clock calendar, parallel port, game port and two serial ports.
- ✓ Key Tronic 101 key keyboard.
- ✓ 8 slots & 5 drive bays.
- ✓ Built-in memory management.
- ✓ MS-DOS 5.0.
- ✓ Windows & Logitech Mouse add $69.
- ✓ FCC Class B approved.

386/DX33	80mb	100mb	200mb	340mb
Mono	$1,379	$1,449	$1,699	$2,099
Mono VGA	$1,479	$1,549	$1,799	$2,199
VGA 1024i	$1,679	$1,749	$1,999	$2,399
VGA 1024ni	$1,729	$1,799	$2,049	$2,449

intel inside



FastData NoteBook

New 80mb SX/20 model!
Call for pricing& specifications.

All FastData Systems Include:

- **Toll-Free Technical Assistance for Life**
- **'FastSHIP' Advance Parts Replacement**
- **On-Site Service or System Replacement Should Unusual Problems Arise**
- **30 Day Money Back Guarantee**
- **FastMicro Peace of Mind**

FastData SX Systems

$1399 FastData SX/20

25% faster than a 16mhz SX, the FastData SX/20 adds even greater performance to its 386 multitasking capabilities. Just $200 more than our SX/16, this machine also includes an 80mb hard drive in addition to the super VGA color monitor and 16 bit VGA adaptor, Keytronics keyboard, DOS 4.01 or 5.0, and two floppy drives. The system includes two megabytes of memory and is expandable to eight on the main system board. Remember, when you have questions, need to solve a problem, or want recommendations on products for your system, the FastMicro team is standing by toll-free to provide product support for as long as you own your FastData personal computer.

Standard Features

- ✓ 20mhz Intel™ 386-SX processor.
- ✓ 2 megabytes of high speed RAM.
- ✓ 80 mb 20ms IDE hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" and 1.44mb 3.5" floppy drives.
- ✓ Standard chassis (shown) or mini-tower with keylock, speed and reset buttons.
- ✓ 200 watt power supply
- ✓ 14" Super VGA color monitor with 16 bit VGA card with 512K.
- ✓ Clock calendar, parallel port, two serial ports, and game port.
- ✓ Key Tronic 101 key keyboard.
- ✓ 8 expansion slots, 5 drive bays.
- ✓ 80387-SX coprocessor socket.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ Windows & Mouse add $69.
- ✓ MS-DOS 5.0.
- ✓ FCC Class B approved.

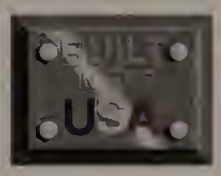
$1249 FastData 386/SX

Combine the benefits of an advanced Intel 386 processor, the value of a 286 and the advantages of FastData and you've got the FastData 386/SX! This machine is the choice of those who want to run today's powerful 386 and multitasking software, like Windows, and also want to run their favorite DOS applications at surprising speeds. We've made our customers' favorite options standard: it comes with an ample two megabytes of memory, a high performance 40mb hard drive, and 16 bit super VGA. Compare performance, features, and service and you will find no better SX value. Interested further? Try the FastData 386/SX for 30 days; you have to be happy - if not, we'll take it back.

Standard Features

- ✓ 16mhz Intel™ 386-SX processor.
- ✓ 2 megabytes of fast RAM.
- ✓ 40 mb 28ms IDE hard disk, 1:1 interleave.
- ✓ 1.2mb 5.25" and 1.44mb 3.5" floppy drives.
- ✓ Standard , mini tower, or mini desktop (shown) chassis with keylock, speed and reset buttons.
- ✓ 200 watt power supply
- ✓ 14" Super VGA color monitor with 16 bit VGA card with 512K.
- ✓ Clock calendar, parallel port, two serial ports, and a game port.
- ✓ Key Tronic 101 key keyboard.
- ✓ 8 expansion slots, 5 drive bays.
- ✓ 80387-SX coprocessor socket.
- ✓ Full Shadow RAM and LIM 4.0 EMS support.
- ✓ Windows & Mouse add $69.
- ✓ MS-DOS 5.0.
- ✓ FCC Class B approved.

386/SX20	40mb	80mb	100mb	200mb
Mono	$969	$1,099	$1,169	$1,419
Mono VGA	$1,069	$1,199	$1,269	$1,519
VGA Color	$1,219	$1,349	$1,419	$1,669
VGA 1024i	$1,269	$1,399	$1,469	$1,719



386/SX16	40mb	80mb	100mb	200mb
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Mono VGA	$1,049	$1,179	$1,249	$1,499
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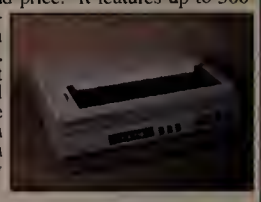

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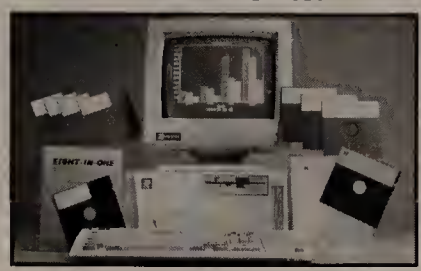

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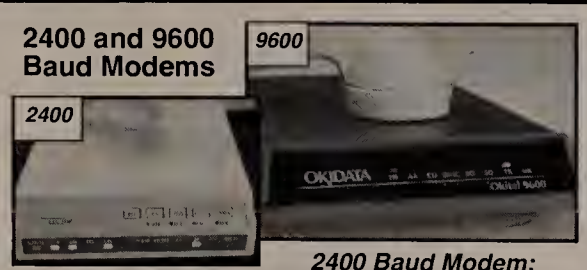

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Video Titler by Entropy Engineering $365

Integrated Multimedia Systems from Video Associates
MicroKey/A - audio, video, VGA and more $1429
DigiView - flash capture digitizer board 859
Genlock - broadcast quality genlock/overlay 669
LinkPlus - antiflicker filter, composite color keyer 379

New Media Graphics - Windowed video for MS Windows !!!
Super Video Windows Board w/ software $895
Super Video Windows Tuner Board (for TV input) 295
Super Video Windows Developer's Kit 395

Video Monitors & Controllers

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MF-5217 17" flat screen color 1024 x 768 non-interlaced 72-Hz refresh rate, .28-mm dot pitch $1295
MF-5221 21" flat screen color, 1280x1025, .31mm ..... CALL
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Viking 3/91GS 20" 4/8-bit grayscale monitor & contr 1999
Viking 3/2400M 24" monitor & controller 1999

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3FGX flat screen 14", 1024 x 768 non-interlaced $649
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5FG flat screen 17", 70Hz non-interlaced, AccuColor 1429
6FG flat screen 21" 70Hz non-interlaced, AccuColor 2999

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microLeser Plus PS-35 PostScript, 35 fonts, 9-ppm 1629
microLeser XL PS-17 PostScript, 17 fonts, 16-ppm 2459
microLaser XL PS-35 PostScript, 35 fonts, 16-ppm 2759
microLaser Turbo PS-35 PostScript 2, 35 fonts, 9-ppm 2059
microLaser XL Turbo PS-35 PostScript 2, 35 fonts, 16-ppm 3359

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LBP-8 Mark III Plus resolution-enhanced laser ..... CALL

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SilentWriter2 Mod 90 300-dpi, 4-MB RAM, PostScript 1729

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Turbo PS/840 800 x 400 dpi, w/ ART ..... CALL
Turbo PS/840E 800 x 400 dpi, w/ ART & IET ..... CALL

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OL400 300-dpi, HP PCL emulation $635
OL830 300-dpi, PostScript & scelable HP PCL fonts 1399
OL840 PostScript, 35 fonts, 2-MB RAM 1799

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Adobe PostScript Cartridge HP LJ II $329
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PacificPage PE PostScript Cartridge 395
PacificPage XL *ecce/erated* Postscript cartridge 799
Type City by Bitstream for HP LaserJet 258
25 Plus/Charisma font cartr. for HP LJ by Elite 249
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OCR (Optical Character Recognition)
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Celere WordScan Plus - PC Mag Editor's Choice 665
Catchword DCR for Logitech hand scanners 145
OmniPage 386 Professional by Caere (trainable) 639
ReedRight for Windows / ReadRight v2.01-DDS 314/299

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Deluxe Paint II Enhanced by Electronic Arts $99
Gray F/X by Xerox-Datacopy (DOS application) 295
IMAGE-IN COLOR (works with WACOM tablets) 695
PhotoStyler by Aldus (U-Lead) ..... CALL
Picture Publisher Plus by Astral/Micrografx 469
Publisher's Paintbrush for Windows by Z-Soft 285
Tempra Pro by Mathematica (DOS application 24-bit) 345
WinRix for Windows (color image editor) 295

Color & Grayscale Scanner Systems

Logitech ScanMan 32 scans up to 400-dpi and 32 gray levels. Bundled with software $158
Logitech Scanman 32 w/ Catchword OCR s/w bundle 229
Logitech Scanman 256 400 dpi, 256 grays, Windows 3.0 285
Logitech Scanman 256 bundled w/ Catchword DCR 429

Microtek ScanMaker 600Z 600-dpi, 24-bit color, 8-bit grayscale. Bundled with PhotoStyler 1345
Microtek ScenMaker 600G 600-dpi, 8-bit grayscale, Bundled with PhotoStyler 1075
Microtek ScanMaker 1850 35-mm photo slide scanner. Scans color and B&W 35-mm slides and negatives. Bundled with PhotoStyler. 1850 x 1850 dpi resolution 2149

Niscen GS for Windows hand-held, 256 gray levels. Bundled w/ Imege In Scan, Paint and Plus for Windows 229
Niscan GS with OCR hand-held, 256 gray levels. Bundled w/ Image In Scan, Paint and Plus (Windows 3.0 software) and Perceive Personal DCR software 335
Niscan Spectra color hand-held scanner, 24-bit, 16.7 million colors w/software 599

The Typist + Graphics hand-held DCR scanner. Easy and effective way to input text right into your favorite word processor. Just scan the document & you're ready to go. 395

Hercules Graphics Station

The **Hercules Graphics Station** video card takes the wait out of Windows, CAD and other graphics-intensive applications. The secret is the on-board Texas Instruments 34010 graphics co-processor operating at 60-MHz. It frees the CPU from the drudgery of graphics processing so you won't have to wait for your screen to catch up to you. Oisplays true color for photo-realistic images in 16 or 24-bit modes (32,768 or 16.7 million colors) Comes with drivers for Windows 3.0, AutoCAD release 10 & 11, 3D Studio, Autodesk Animator Pro, AutoShade and more.

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Graphics Station 3-MB for PC-AT ISA bus 695
Graphics Stetion 1-MB for Microchannel bus 695
Graphics Stetion 4-MB for Microchannel bus 969
Graphics Stetion 8-MB for Microchannel bus 1295
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NEC
ColorMate model 40 / mod 80 upgrade kit .. $4695 / 1699

QMS
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ColorPoint PSX 4 (uitra-fast, 10-MB RAM) 7199

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DXY-1200 8-pen A-B-size flatbed plotter 999
OXY-1300 8-pen A-B-size flatbed plotter 1359
DPX-2500 8-pen/pencil, 1-MB, A-C size 3395
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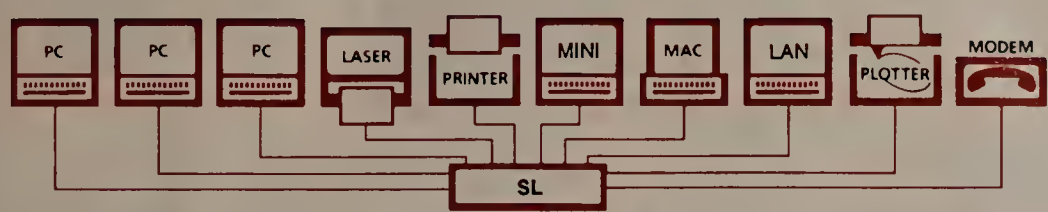

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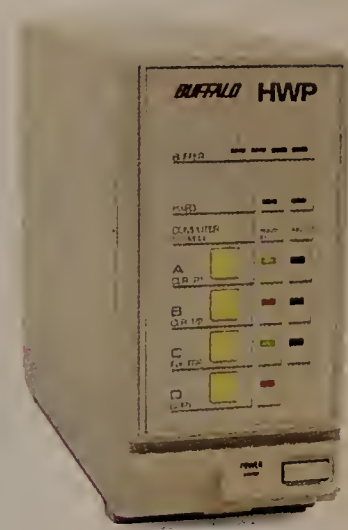

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Model Name	Total Ports	PCs/ Printers	Memory Available	Printer Selection	Price $ / Buffer
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SLP	10 8 Par., 2 Ser.	Any Combination	256KB - 4MB	Pop-up Menu	**$495** / 256KB **$595** / 1MB
HXM	4 2 Ser., 2 Par.	Any Combination	256KB - 16MB	Pop-up or Buttons	**$295** / 256KB **$395** / 1MB
HXS	4 Serial	Any Combination	256KB - 16MB	Pop-up or Buttons	**$295** / 256KB **$395** / 1MB
HWP	5 Parallel	3/2 4/1	256KB - 16MB	Pop-up or Buttons	**$295** / 256KB **$395** / 1MB
HXP	4 Parallel	2/2 3/1	256KB - 16MB	Pop-up or Buttons	**$245** / 256KB **$345** / 1MB
HCP	2 Parallel	1/1	256KB - 16MB	One Printer	**$225** / 256KB **$325** / 1MB
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Premium 386/33	1Meg	500718-002		69.00
Premium II	1Meg	500780-003	WPB	85.00
386SX20, 486-25, 25E, 33	4Meg	500780-004	WPB	209.00
Premium Tower, 386/33TE, 486/25TE, 486/33TE	8Meg	500780-001	WPB	418.00

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Z386/33, 25, 20	4Meg	ZA3800MK	299.00
Z248, Z286LP Z386SX	2Meg	Z-605-1 *modules*	149.00

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IBM PART NO.	WORKS WITH MODEL NO.	L.A. TRADE'S COMPT. PRICE
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30F5360 (2Meg)	30-286, 50 MTHR BD.	110.00
6450375 (1Meg)	80-041	65.00
6450379 (2Meg)	80-111, 311	139.00
6451060 (4Meg)	80-A21, A-61, 80-A31, 80-111, 80-311	249.00
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6450604 (2Meg)	35SX, 40SX, 50Z, 55SX, 55LS, Model 70-E, 061, 121, P-70	99.00
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34F2933 (4Meg)	35SX, 40SX, 55SX, 65SX	199.00
87F9977 (4Meg)	55SX, 55LS, 65SX, 40SX, 35SX, 35LS	199.00
1383679 (512K), (2Meg)	P/S1	50.00, 139.00
6450902 (2Meg)	57SX,90, 95, P-75	119.00
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	8Meg Module	116561-001	499.00
DeskPro 386/33	2Meg Module	115144-001	139.00
DeskPro 386/25, 386/20	1Meg Module	113131-001	59.00
	4Meg Module	113132-001	199.00
DeskPro 386S	1Meg Exp 8d	113633-001	139.00
	4Meg Exp 8d	113634-001	279.00
	1Meg Module	113646-001	79.00
	4Meg Module	112534-001	209.00
DeskPro 386/20E	1Meg Exp 8d	113644-001	129.00
DeskPro 386/25E	4Meg Exp 8d	113645-001	279.00
	1Meg Module	113131-001	59.00
	4Meg Module	113132-001	199.00
DeskPro 286N, 386N, 386SX20	1Meg Module	118688-001	59.00
	2Meg Module	118689-001	119.00
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DeskPro 386/16	1Meg Kit	108071-001	119.00
	4Meg Kit	108072-001	269.00
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Compaq Lte 386S/20	1Meg Module	121125-001	149.00
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T2000/T2000SX	1Meg	PC18-PA8316U	119.00
T2000/T2000SX	2Meg	PC18-PA8317U	179 00
T2000SX/T1000LE	4Meg	PC-PA8314U	379.00
T2000SX/T1000LE	8Meg	PC14-PA8315U	649.00
T2000SXE/2200SX	2Meg	PC-PA2000U	189.00
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T1200XE	2Meg	PC13-PA8306	119.00
T1600	2Meg	PC8-PA8302U	119.00
T3100e	2Meg	PC9-PA8340U	119.00
T3100SX	2Meg	PC15-PA8308U	119.00
T3100SX	4Meg	PC15-PA8310U	219.00
T3200	3Meg	PC6-PA7137U	219.00
T3200SX	2Meg	PC12-PA8307U	119.00
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T5200/T8500	2Meg	PC10-PA8304U	119.00
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BRANDNAME LAPTOP MEMORY

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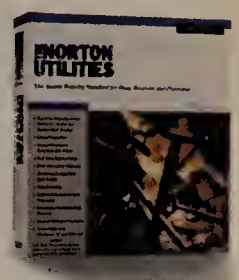

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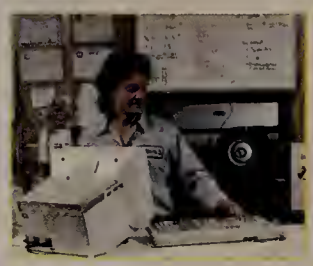
- tracks promotional sales
- prints bar code labels
- reorder reports
- extensive sales reports
- item/invoice discounts
- tracks sales by employees
- set limited-time promos
- links to One-Write Plus
- receiving reports
- pop-up calculator
- built-in word processor
- works on any IBM PC or compatible with hard disk drive
- Multiuser and source code available
- dBase compatible compiled with Clipper...



Auto Repair Shop Controller

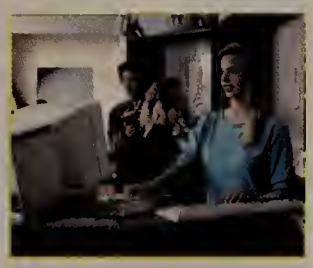
★ Maximize inventory, track detailed service history, guarantee repeat business, reduce billing errors, improve cash flow, schedule appointments and produce reports for smarter business decisions directly.

Video Store Controller

★ This "beginner-proof" video retail management system is flexible enough to work in any location. Scan a bar code or key in video membership information. Financial and rental information is always up to the minute.

Liquor Store Controller

★ Multi User for two or more stations. Used by thousands of growing liquor stores and chains nationwide. Monitor every sale, reduce theft, increase profits and meet the needs of your customers.



Hair & Nail Salon Controller

★ Imagine a computerized system that keeps in touch with your clients, sending out birthday cards, perm and color reminder letters, customer "thank you" notes...plus keeps complete financial control of your business!

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THE HOME OFFICE

The practical guide to home/office computing

Steve Bass

Besides my word processor, the most important programs on my hard disk are utilities. Over the years I've collected a toolbox of indispensable gems I use regularly—sometimes even daily.

Utilities come in all shapes and sizes. What most have in common is dedication to one or two specific tasks. Many are shareware or in the public domain; some are commercial. I found most of mine via the Pasadena IBM User Group library, local BBS's, and shareware mail-order houses.

Like all tools, utilities have to be handy. To make sure I have instant access to these programs, I created a UTIL subdirectory and added it to my AUTOEXEC.BAT's PATH command.

Because I'm in and out of text files all day—doing a quick edit on an outgoing E-mail file, changing my CONFIG.SYS or WIN.INI file, or revising an *Xbase* program file—*QEdit* is my most often used utility. Using this flexible and inexpensive shareware text editor, I can open multiple files simultaneously from the DOS prompt with a single batch command. For example, I edit CONFIG.SYS, AUTOEXEC.BAT, and a series of .INI files with CONFIG.BAT (**Q CONFIG.SYS AUTOEXEC.BAT C:\WINDOWS*-.INI**), a batch file that brings up *Qedit* with all those files loaded.

For $10 and 2K of RAM, *DialThat* will pluck any phone number out of any file displayed on screen and dial it. When it rings, pick up the phone and talk. My second favorite, *dbDIAL*, dials numbers and acts as a personal electronic Rolodex for only 7K of RAM. I can track unlimited clients, user group members, and others with two addresses and four phone numbers each. In addition, this utility logs every call I make and reminds me to make follow-up calls.

I use *Ventura Publisher* for DOS to produce the Pasadena IBM User Group newsletter. I have a full-page Radius monitor at the office, but when I'm home Aristosoft's *Softkicker* screen driver lets me quickly scroll to portions of my *Ventura* document that are beyond the borders of my 14-inch monitor.

MICHAEL BARTALOS

When Victor Borge was asked what the middle pedal on a piano was for, he said, "to keep the other two pedals apart." Only God and Bill Gates know why the right mouse button is ignored by most *Windows* programs. But when I use *Windows*, *RightOn* lets me program the right and middle mouse buttons to execute frequently used menu items or any two-character command quickly. That allows me to switch between *Excel* and *Word for Windows* with a touch of the mouse. Using the right mouse button with other control keys broadens my repertoire.

With two Plus Hardcards, a 90MB Bernoulli, and a fixed disk, I have more than 400MB of data stretched across six partitions; it's easy to lose files. *SST* searches each drive and finds files at speeds that seem to defy physics.

The next time you're on a bulletin board or at a swap meet and you see an interesting utility, give it a shot. You may find the next WD-40.

Contributing Editor Steve Bass is a family therapist and president of Pasadena IBM Users Group.

dbDial $49, Zpay Payroll Systems Inc.; 800/468-4188, 813/866-8233
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DialThat $10, Real Software; 408/476-3550, 408/476-1055 (BBS)
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QEdit $54.95, SemWare; 404/641-9002
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RightOn $49.95, Fanfare Software; 818/886-8787, 818/886-2250 (fax)
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Softkicker $99, Aristosoft; 800/426-8288, 415/426-5355
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SST $15, Keith Ledbetter; 804/674-0780
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   ☐ 286-based systems ☐ i486-based systems
   ☐ i386™SX-based systems ☐ UNIX® based systems
   ☐ i386-based systems ☐ Notebooks
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2. Are you interested in computer products for:
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3. If for resale, please identify your primary customers:
   ☐ General Business ☐ Government ☐ Education ☐ Medical
4. How many PCs does your company plan to purchase in the next twelve months?

Quantity	Timeframe	Quantity	Timeframe
_____	Less than 1 month	_____	6-12 months
_____	1-3 months	_____	More than 12 months
_____	3-6 months		

5. What do you plan to use computer products for?

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6. How many PCs do you have installed now at your company?

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PC MAGAZINE EDITORS' CHOICE 8-1-91

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And all backed by Dell, the company that's built a $546 million international business by always going above and beyond the call. By putting them through tests the Marines would be proud of. And backing each one with a service and support package described as "overkill" by the editors of *PC Week*.

So if you need a computer you can fire up without getting fired, call Dell today. We promise you won't get burned.

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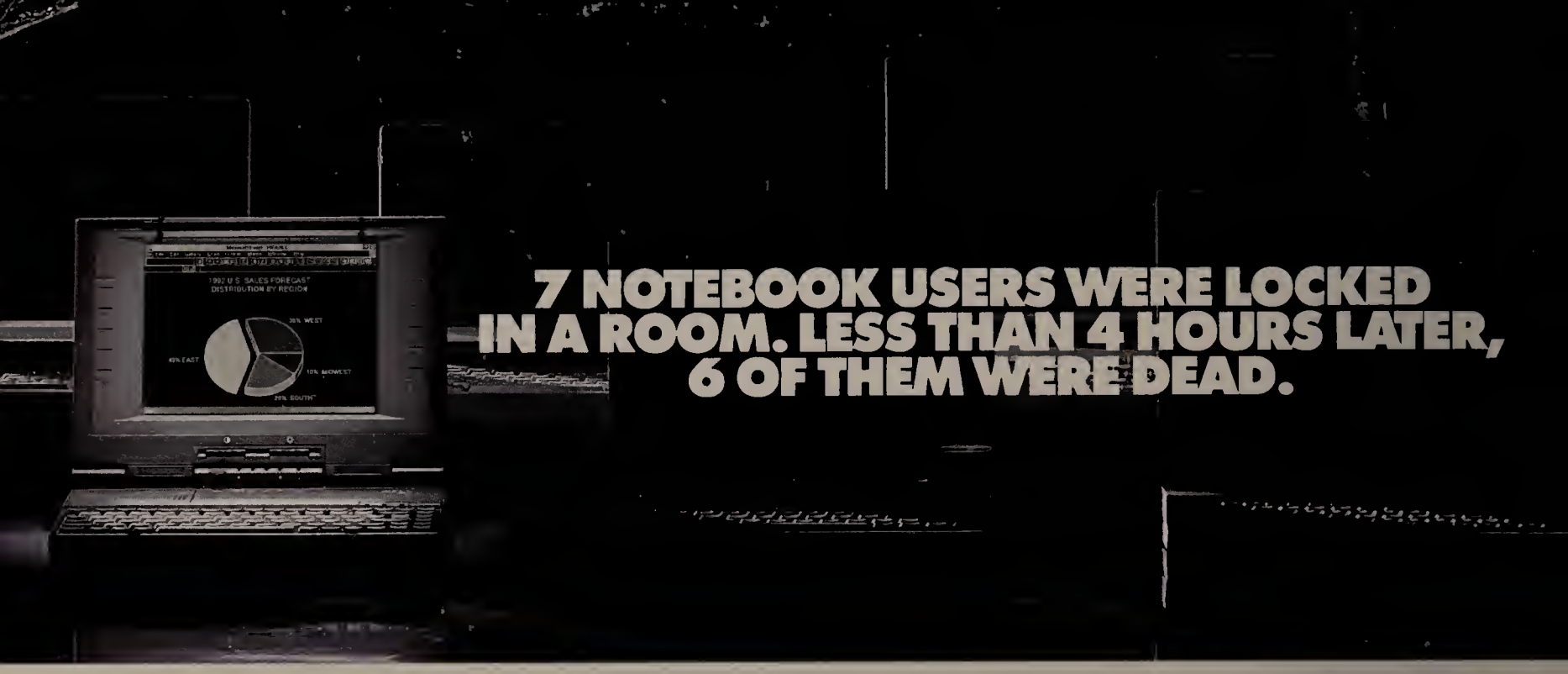

Recently, an independent laboratory ran *PC Magazine's* Battery Rundown Test on 7 leading notebook computers. And we're happy to report that Dell came in dead last.

In fact, Dell's power management system and NiMH battery helped the 320N+ run a full 30 minutes longer than the nearest competitor. More than enough to get you through the next marathon meeting or epic plane flight.

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Zenith MastersPort 386SL	*2:26 Hours*
AST Premium Exec	*2:08 Hours*
IBM PS/2 Model L40SX	*1:55 Hours*

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We charge less.

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